Service Manual

RC-60 & RC-60 Turf Edition Rubber Track Loaders

- Safety Overview
- Technical Specifications
- System Diagrams
- Disassembly and Assembly Instructions
- Troubleshooting
- Maintenance
- Hydraulic Pressure Check & Adjustment

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Table of Contents

1. Product Safety

Chapter Overview 1-1
Safety Messages 1-1
Information Messages 1-1
Basic Precautions 1-1
- Safety Signs 1-1
- Protective Equipment 1-2
- Mounting and Dismounting 1-2
- Lifting 1-2
- Hot Fluids and Parts 1-2
- Corrosion Inhibitor 1-2
- Batteries 1-2
- Pressurized Items 1-2

Repair 1-3
Work Tools 1-3
Asbestos Information 1-4
Machine Labels and Decals 1-4
- Product ID Number 1-4
- Machine Label and Decal Examples 1-5

2. Technical Specifications

Chapter Overview 2-1
Specifications 2-1
- Engine 2-1
- Transmission 2-1
- Drive Motors 2-1
- Control Handles 2-1
- Auxiliary Pump 2-1
- Loader Valve 2-1
- Cooler 2-1

3. System Diagrams

Chapter Overview 3-1
Filtering and Cooling System 3-1
Auxiliary Circuit System (RC-60) 3-2
Drive Loop System (RC-60) 3-3
Auxiliary Circuit System (R-60) 3-4
Drive Loop System (R-60) 3-5

4. Machine Controls and Instrumentation

Chapter Overview 4-1
Machine Controls 4-1
- Loader Control 4-1
- Drive Control 4-1
- Throttle 4-1

Dash Panel 4-1
Gauge/Warning Light Panel 4-2

5. Operator Enclosure Disassembly and Assembly

Chapter Overview 5-1
Personal Safety 5-1
Machine Preparation 5-1
Preliminary Checkout 5-1
Operator Enclosure Disassembly and Assembly Procedures 5-1
Light Bar Removal and Installation 5-1
- Light Bar Removal 5-1
- Light Bar Installation 5-2

Ignition Switch Removal and Installation 5-2
- Ignition Switch Removal 5-2
- Ignition Switch Installation 5-3

Console Gauge/Warning Panel Removal and Installation 5-4
- Console Gauge Removal 5-4
- Console Gauge Installation 5-4

Lap Bar Gas Assist Spring Removal and Installation 5-5
- Lap Bar Gas Assist Spring Removal 5-5
- Lap Bar Gas Assist Spring Installation 5-5

6. Chassis Disassembly and Assembly

Chapter Overview 6-1
Personal Safety 6-1
Machine Preparation 6-1
Preliminary Checkout 6-1
Chassis Disassembly and Assembly Procedures 6-1
Seat Removal and Installation 6-1
- Seat Removal 6-1
- Seat Installation 6-2

Fuel Sending Unit Removal and Installation 6-2
- Fuel Sending Unit Removal 6-3
- Fuel Sending Unit Installation 6-3

7. Radiator/Oil Cooler Disassembly and Assembly

Chapter Overview 7-1
Personal Safety 7-1
Machine Preparation 7-1
Preliminary Checkout 7-1
Radiator/Oil Cooler Disassembly and Assembly Procedures 7-1
Fan Guard Removal and Installation 7-1
- Fan Guard Removal 7-2
- Fan Guard Installation 7-2

Radiator/Cooler Removal and Installation 7-2
- Radiator/Cooler Removal 7-2
- Radiator/Cooler Installation 7-4

8. Hydraulic Reservoir Disassembly and Assembly

Chapter Overview 8-1
Personal Safety 8-1
Machine Preparation 8-1
Preliminary Checkout 8-1
Hydraulic Reservoir Disassembly and Assembly Procedures 8-1
Filter Assembly Removal and Installation 8-1
- Filter Manifold Removal 8-2
- Filter Manifold Installation 8-2

Access Cover Removal and Installation 8-2
- Access Cover Assembly Removal 8-2
- Access Cover Assembly Installation 8-3

Reservoir Gauge Removal and Installation 8-3
- Reservoir Gauge Removal 8-3
- Reservoir Gauge Installation 8-4

Suction Screen Removal and Installation 8-4
Suction Screen Removal 8-5
Suction Screen Installation 8-5
Hydraulic Reservoir Cleaning Procedures 8-6
Hydraulic Reservoir Cleaning 8-6

9. Loader/Transmission Controls Disassembly and Assembly

Chapter Overview 9-1
Personal Safety 9-1
Machine Preparation 9-1
Preliminary Checkout 9-1
Loader/Transmission Controls Disassembly and Assembly Procedures 9-1
Joystick Removal and Installation 9-1
Joystick Removal 9-1
Joystick Installation 9-3
Loader Float Magnet Removal and Installation 9-4
Loader Float Magnet Removal 9-4
Loader Float Magnet Installation 9-6
Loader Valve Removal and Installation 9-7
Loader Valve Removal 9-7
Loader Valve Installation 9-9

10. Transmission and Drive Disassembly and Assembly

Chapter Overview 10-1
Personal Safety 10-1
Machine Preparation 10-1
Preliminary Checkout 10-1
Transmission and Drive Disassembly and Assembly Procedures 10-1
Auxiliary Gear Pump Removal and Installation 10-1
Auxiliary Gear Pump Removal 10-1
Tandem Pump Removal and Installation 10-3
Tandem Pump Removal 10-3
Tandem Pump Installation 10-4
Pump Drive Coupler Removal and Installation 10-5
Pump Drive Coupler Removal 10-5
Pump Drive Coupler Installation 10-6

11. Undercarriage Disassembly and Assembly

Chapter Overview 11-1
Personal Safety 11-1
Machine Preparation 11-1
Preliminary Checkout 11-1
Undercarriage Disassembly and Assembly Procedures 11-1
Wheel Removal 11-1
Wheel Removal 11-2
Sprocket Roller Removal and Installation 11-3
Track Removal and Installation 11-3
Track Removal 11-4
Track Installation 11-5
Sprocket Bearing Removal 11-6
Sprocket Bearing Plate Removal 11-6
Sprocket Removal and Installation 11-7
Sprocket Removal 11-7
Drive Motor Removal and Installation 11-8

12. Loader Disassembly and Assembly

Chapter Overview 12-1
Personal Safety 12-1
Machine Preparation 12-1
Preliminary Checkout 12-1
Loader Disassembly and Assembly Procedures 12-1
Lift Cylinder/Tilt Cylinder Removal and Installation 12-1
Lift Cylinder/Tilt Cylinder Removal 12-1
Lift Cylinder/Tilt Cylinder Installation 12-3
Low-Flow Relief Valve Removal and Installation 12-3
Low-Flow Relief Valve Removal 12-3
Low-Flow Relief Valve Installation 12-6

13. Maintenance

Chapter Overview 13-1
Maintenance Schedule 13-1
Engine Oil 13-1
Oil Change Procedures 13-1
Engine Oil Specifications 13-1
Hydraulic Fluid and Filter 13-2
Hydraulic Fluid and Filter Change Procedures 13-2
Fuel Filter 13-3
Fuel Filter Change Procedures 13-3
Fuel Specifications 13-3
Air Cleaner 13-3
Air Filter Change Procedures 13-3
Track Tension 13-4
Track Tension Adjustment Procedures 13-4
Checking for Proper Track Adjustment 13-4
Fuse Box 13-4
Grease Fittings 13-5

14. Hydraulic Pressure Check & Adjustment

Charge Pressure check 14-1
Charge Pressure Adjustment 14-2
Drive Pressure Adjustment 14-3
Auxiliary Pressure Check & Adjustment 14-4

15. Troubleshooting

Chapter Overview 15-1
Personal Safety 15-1
Machine Preparation 15-1
Preliminary Checkout 15-1
Visual Inspection 15-1
Operational Checks 15-1
Troubleshooting Scenarios 15-2

1. Product Safety

Chapter Overview

This chapter contains product safety information for the RC-60 Rubber Track Loader. Read this chapter and understand all safety messages and information messages before attempting to service the machine.

Safety Messages

Safety messages are provided in this document and on the machine. If these hazard warnings are not heeded, bodily injury or death could occur to you or other persons.

Hazards are identified by the Safety Alert Symbols **!DANGER! … . !WARNING!….!CAUTION!**.

The meaning of these safety alerts is as follows: **Attention! Become Alert! Your Safety is Involved.**

The message that appears under a Safety Alert Symbol explains the hazard and can be either written or pictorially presented.

! DANGER !

This symbol is used to alert service personnel of an imminently hazardous situation that will result in serious injury or death.

! WARNING !

This symbol is used to alert service personnel of a potentially hazardous situation that could result in serious injury or death.

! CAUTION !

This symbol is used to alert service personnel of an unsafe practice that could result in injury.

Information Messages

Information messages are provided in this document and on the machine. These messages are identified by the labels **NOTICE….Note**.

NOTICE

This label is used to alert service personnel to the possibility of damaging the equipment.

Note: This label is used to provide important additional information, comments, explanations or amplification of the accompanying subject matter.

The person servicing the Rubber Track Loader may be unfamiliar with many of the systems on the machine. This makes it important to use caution when performing service work. Knowledge of the system and/or components is important before the removal or disassembly of any component.

It is not possible to anticipate every circumstance that might involve a potential hazard. The safety messages in this document and on the product are, therefore, not all-inclusive. If you use a tool, procedure, work method or operating technique that is not specifically recommended by the manufacturer, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedures that you choose.

Basic Precautions

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Following is a list of basic precautions that should always be observed.

Safety Signs

Read and understand all "Safety" signs on the product before operating, lubricating or repairing this product. Replace any damaged, illegible or missing safety plates, signs or decals.

Protective Equipment

Always wear a hard hat, protective glasses, protective shoes and other protective equipment as required by job conditions when working around this product. In particular, wear protective glasses when pounding on any part of the product or its work tool with a hammer or sledge. Use welders gloves, hood/goggles, apron and other protective clothing appropriate to the welding job being performed. Do not wear loose clothing or jewelry that can catch on parts of the product.

Mounting and Dismounting

Use steps and handholds when mounting or dismounting a machine. Clean any mud or debris from steps or work platforms before using them. Always face the machine when using steps and handholds. When it is not possible to use the designed access system, provide ladders, scaffolds, or work platforms to perform safe repair operations.

Lifting

Use a hoist when lifting components that weigh 23 kg (50 lb) or more, to avoid back injury. Make sure all chains, hooks, slings, etc., are in good condition and are of the correct capacity. Be sure hooks are positioned correctly and equipped with a spring latch. Lifting eyes are not to be side loaded during a lifting operation.

Hot Fluids and Parts

To avoid burns, be alert for hot parts on machines that have just been stopped and hot fluids in lines, tubes and compartments.

Be careful when removing fill caps, breathers and plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. The danger is even greater if the machine has just been stopped because fluids can be hot.

Corrosion Inhibitor

Corrosion inhibitor contains alkali. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Do not take internally. In case of contact, wash skin immediately with soap and water. For eyes, flush with large amounts of water for at least 15 minutes. **Call Physician. Keep out of reach of children.**

Batteries

Do not smoke when inspecting the battery electrolyte level. Never disconnect any charging unit circuit or battery circuit cable from the battery when the charging unit is operating. A spark can cause an explosion from the flammable vapor mixture of hydrogen and oxygen that is released from the electrolyte through the battery outlets. Do not let electrolyte solution make contact with skin or eyes. Electrolyte solution is an acid. In case of contact, immediately wash skin with soap and water. For eyes, flush with large amounts of water for at least 15 minutes. **Call Physician. Keep out of reach of children.**

Pressurized Items

1. Always use a board or a piece of cardboard when you check for a leak. Leaking fluid under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pinhole leak can cause severe injury. If fluid is injected into your skin, get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.
2. Relieve all pressure in air, oil or water systems before disconnecting or removing any lines, fittings or related items. Always make sure all raised components are blocked correctly and be alert for possible pressure when disconnecting any device from a system that utilizes pressure.
3. Lower the bucket, blade, or other work tool to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, blade, or other work tool is blocked correctly to prevent it from dropping unexpectedly.
4. Loose or damaged fuel, lubricant and hydraulic lines, tubes and hoses can cause fires. Do not bend or strike high-pressure lines or install ones that have been bent or damaged. Check lines, tubes and hoses carefully. Do not use your bare hand to check for leaks.
5. Pressurized air or water can cause personal injury. When pressurized air or water is used for cleaning, wear a protective face shield, protective clothing, and protective shoes. The maximum air pressure for cleaning purposes must be below 205 kPa (30 psi). When using a pressure washer, keep in mind that nozzle pressures are very high, generally pressures are well above 13790 kPa (2000 psi). Follow all recommended practices provided by the pressure washer manufacturer.

Repair

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

1. Disconnect battery and discharge any capacitor before starting to work on the product. Attach a **Do Not Operate** tag in the Operator's Compartment.
2. If possible, make all repairs with the machine parked on a level, hard surface. Block the machine to prevent it from rolling while working on or under the machine.
3. Do not work on any machine that is supported only by lift jacks or a hoist. Always use blocks or jack stands to support the machine before performing any service or disassembly.
4. Make sure the work area around the product is made safe and be aware of hazardous conditions that may exist. If an engine is started inside an enclosure, make sure that the engine's exhaust is properly vented.
5. Be sure all protective devices including guards and shields are properly installed and functioning correctly before starting a repair. If a guard or shield must be removed to perform the repair work, use extra caution.
6. Always use tools that are in good condition and be sure you understand how to use them before performing any service work.
7. Replace all fasteners with the same part number. Do not use a lesser quality fastener if replacements are necessary.
8. Be prepared to stop an engine if it has been recently overhauled or the fuel system has been recently worked on. If the engine has not been assembled correctly, or if the fuel settings are not correct, the engine can possibly overspeed and cause bodily injury, death or property damage. Be prepared to shut off the fuel and air supply to the engine in order to stop the engine.
9. Be careful when removing cover plates. Gradually back off the last two bolts or nuts located at opposite ends of the cover or device. Then, pry the cover loose to relieve any spring or other pressure before removing the last two nuts or bolts completely.
10. Repairs requiring welding should be performed only with the benefit of the appropriate reference information and by personnel adequately trained and knowledgeable in welding procedures. Determine the type of metal being welded and select the correct welding procedures and electrodes, rods or wire to provide a weld metal equivalent at least to that of the parent weld.
11. Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged during installation or operation by contacting sharp corners or by rubbing against some object or hot surface.
12. Always use lift arm supports to keep lift arms raised. Keep the work tool tilted down and assure that all hydraulic pressure has been relieved for maintenance or repair work that requires the lift arms to be in the raised position.
13. Tighten connections to the correct torque. Make sure that all heat shields, clamps and guards are installed correctly to avoid excessive heat, vibration or rubbing against other parts during operation. Shields that protect against oil spray onto hot exhaust components in event of a line, tube or seal failure must be installed correctly.
14. Do not operate a machine if any rotating part is damaged or contacts another part during operation. Any high-speed rotating component that has been damaged or altered should be checked for balance before reusing. Make sure all protective devices, including guards and shields, are properly installed and functioning correctly before starting the engine or operating the machine.

Work Tools

Only use work tools that are recommended by the manufacturer of the machine.

Make sure that all necessary guarding is in place on the host machine and on the work tool.

Wear protective glasses and protective equipment as required by conditions or as recommended in the work tool's operation manual.

Ensure that all personnel are far enough away from the work area so they will not be struck by flying objects.

Stay clear of the cutting edges, pinching surfaces or crushing surfaces of the work tool while performing any work tool maintenance, testing or adjustments.

Asbestos Information

Equipment and replacement parts shipped from the manufacturer are asbestos free. When replacement parts are required, use only genuine manufacturer's replacement parts

Use caution when handling replacement parts from another supplier if these parts contain asbestos. Avoid inhaling dust that might be generated when handling these components or when handling asbestos debris. Inhaling this dust can be hazardous to your health.

The components that may contain asbestos fibers are lining material, and some gaskets. The asbestos that is used in these components is usually encased in a resin or sealed in some way. Normal handling is not hazardous unless airborne dust containing asbestos is generated.

If dust that may contain asbestos is present, there are several guidelines that should be followed.

1. Never use compressed air for cleaning. Avoid brushing or grinding materials that contain asbestos. Use a wet method to clean up asbestos debris. A vacuum that is equipped with the high-efficiency particulate air filter (HEPA filter) can also be used.
2. Use exhaust ventilation on permanent machining jobs.
3. Wear an approved respirator if there is no other way to control the dust.
4. Comply with applicable rules and regulations for the work place. In the USA, use Occupational Safety and Health Administration requirements. These OSHA requirements can be found in 29 CFR 1910.1001.
5. Obey environmental regulations for disposal of asbestos.
6. Stay away from areas that might have asbestos particles in the air.

! WARNING !

When replacement parts are required for this product, use only genuine manufacturer's replacement parts or parts with equivalent specifications including, but not limited to physical dimensions, type, strength and material.

Failure to heed this warning can lead to premature failures, product damage, personal injury or death.

Machine Labels and Decals

Labels and decals placed on the machine provide safety information and operating instructions. Make sure you know the location of these labels and understand their significance.

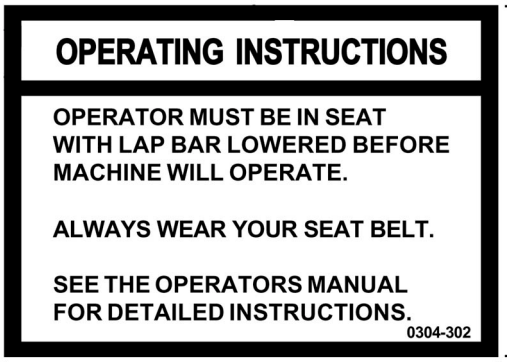
Product ID Number

The product ID number (PIN) is located on the left side of the firewall (Figure 1-1). Always provide the PIN when contacting the dealer about parts, service, warranty or accessories. No warranty claims will be processed unless the PIN is provided.

Figure 1-1 1-001

Machine Label and Decal Examples

Examples of the labels and decals placed on the machine are shown on this page.

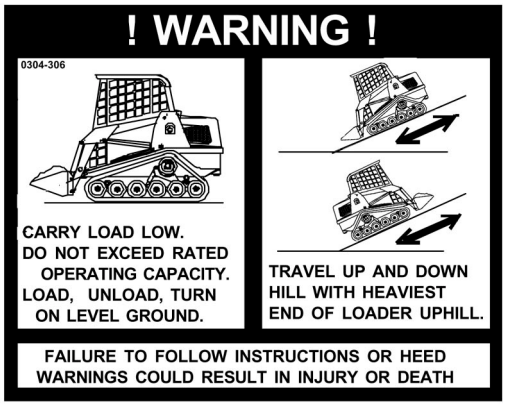

OPERATING INSTRUCTIONS
OPERATOR MUST BE IN SEAT WITH LAP BAR LOWERED BEFORE MACHINE WILL OPERATE.
ALWAYS WEAR YOUR SEAT BELT.
SEE THE OPERATORS MANUAL FOR DETAILED INSTRUCTIONS.
0304-302

! WARNING !
MOUNTING AND DISMOUNTING
MAINTAIN 3-POINT CONTACT
(2 FEET AND 1 HAND OR 1 FOOT AND 2 HANDS)
WITH STEPS AND HAND HOLDS
WHEN LEAVING LOADER:
1. PARK MACHINE ON LEVEL GROUND
2. LOWER WORK TOOL TO GROUND
3. STOP ENGINE AND REMOVE IGNITION KEY
4. REMOVE SEAT BELT
PARKING BRAKE IS APPLIED AUTOMATICALLY
0310-122
FAILURE TO FOLLOW INSTRUCTIONS OR HEED WARNINGS COULD RESULT IN INJURY OR DEATH

! DANGER !
KEEP YOUR BODY INSIDE OPERATOR STATION WHILE OPERATING LOADER
NEVER WORK WITH YOUR ARMS, FEET OR LEGS BEYOND OPERATOR STATION
FAILURE TO FOLLOW INSTRUCTIONS OR HEED WARNINGS COULD RESULT IN SERIOUS INJURY OR DEATH

! WARNING !
LOADER LIFT ARM BRACE MUST BE IN PLACE WHEN WORKING UNDER LIFT ARMS
TO ENGAGE:
1. REMOVE WORK TOOL, PARK MACHINE ON LEVEL GROUND, LOWER LIFT ARMS.
2. RELEASE PIN THAT SECURES BRACE TO FENDER.
3. WRAP SPRING AROUND CYLINDER AND ATTACH TO OTHER SIDE OF BRACE.
4. RAISE LIFT ARMS UNTIL BRACE RESTS ON CYLINDER ROD.
5. SLOWLY LOWER LIFT ARMS UNTIL BRACE STOPS MOVEMENT.
6. SHUT OFF ENGINE AND EXIT MACHINE.
TO DISENGAGE:
1. REMOVE SPRING FROM CYLINDER.
2. RAISE LIFT ARMS UNTIL BRACE FALLS AWAY FROM CYLINDER ROD.
3. LOWER LIFT ARMS ALL THE WAY DOWN.
4. SHUT OFF ENGINE AND EXIT MACHINE.
5. REATTACH BRACE TO FENDER.
0304-313
FAILURE TO FOLLOW INSTRUCTIONS OR HEED WARNINGS COULD RESULT IN INJURY OR DEATH

! DANGER !
KEEP OUT OF THIS AREA
LOADER LIFT ARM MUST BE RESTING ON LOADER STOPS WHEN WORKING UNDER RAISED LIFT ARM
0310-139
FAILURE TO FOLLOW INSTRUCTIONS OR HEED WARNINGS COULD RESULT IN DEATH OR SERIOUS INJURY


! WARNING !
0304-306
CARRY LOAD LOW.
DO NOT EXCEED RATED OPERATING CAPACITY.
LOAD, UNLOAD, TURN ON LEVEL GROUND.
TRAVEL UP AND DOWN HILL WITH HEAVIEST END OF LOADER UPHILL.
FAILURE TO FOLLOW INSTRUCTIONS OR HEED WARNINGS COULD RESULT IN INJURY OR DEATH

2. Technical Specifications

RC-60 Specifications

Engine

- Model: Cat 3024CT
- Displacement: 2.2 liter
- Gross horsepower: 60 hp, 44.7 kW
- Torque: 140 lb-ft.190 Nm
- Idle rpm: 2800 (high idle); 1175 (low idle)
- Average water /thermostat temperature: 190°F, 87.8°C

Transmission

- Model: Cat AA20VG45T tandem (Rexroth)

Drive pumps

- Displacement: 2.7459 in^3/rev (45 cc/rev)
- Relief pressure: 5500 psi, 380 bar
- Flow: 33.2 gpm (125 lpm) @ 2800 rpm (high idle)

Charge pump

- Displacement: 1.098 in^3/rev (18 cc/rev)
- Relief pressure: 400-450 psi

Drive Motors

- Model: Rexroth MCR 05C
- Displacement: 37.8 in^3/rev (620 cc/rev)

Control Handles

- Model: CAT 4TH6

Auxiliary Pump

- Make: Haldex-Barnes #180-2061
- Displacement: 1.343 in^3/rev (22 cc/rev)
- Flow: 16.27 gpm (61.85 lpm) @ 2800 rpm (high idle)
- Relief pressure: 3000 psi (20,684 kPa)
- Cooling/filtering: Auxiliary oil is filtered and cooled at all times. In Auxiliary mode, the oil is filtered after the attachment to protect the machine if the attachment motor fails or contaminants are introduced from the quick couplers.

Loader Valve

- Model: Husko
- Relief pressure: 3000 psi (20,684 kPa)
- Pilot pressure required to move spools: 180-220 psi (1241-1517 kPa)

Cooler

- Burst pressure: 400 psi (2757 kPa)
- Operating pressure: 250 psi (1724 kPa)
- Bypass relief pressure: 80 psi (689 kPa)
- Hot oil sending unit: 225°F (107.2°C)

Critical Torque Specs

- Transmission Mounting Bolts
  - 85 ft-lb. w/Blue Loctite
- Drive Sprocket Drive Teeth Bolts
  - 105 ft-lb. -Dry
- Bogie Wheel Retaining Nut
  - 125 ft-lb. -Dry
- Drive Sprocket Lug Nut
  - 160 ft-lb. -Dry
- Drive Motor Mounting Bolts
  - 160 ft-lbs. -Dry

3. System Diagrams

Chapter Overview

This chapter contains diagrams for the following RC-60 systems.

- Filtering and cooling system
- Auxiliary circuit system
- Drive loop system

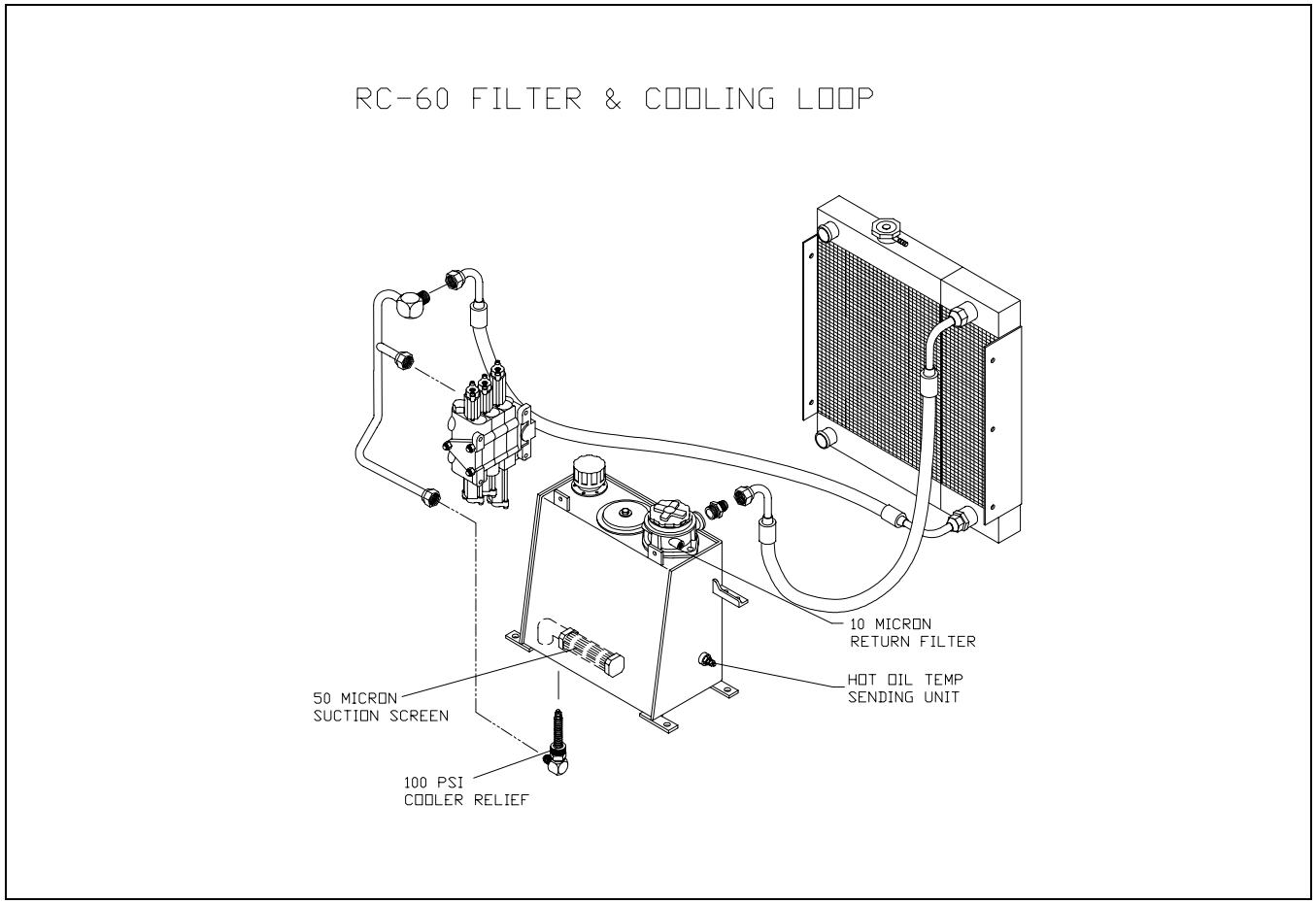
Filtering and Cooling System

The filtering and cooling system (Figure 3-1) contains the following major components.

- Hydraulic reservoir
- Radiator/oil cooler
- Loader valve

Figure 3-1

RC-60 Filtering and Cooling System 3-001



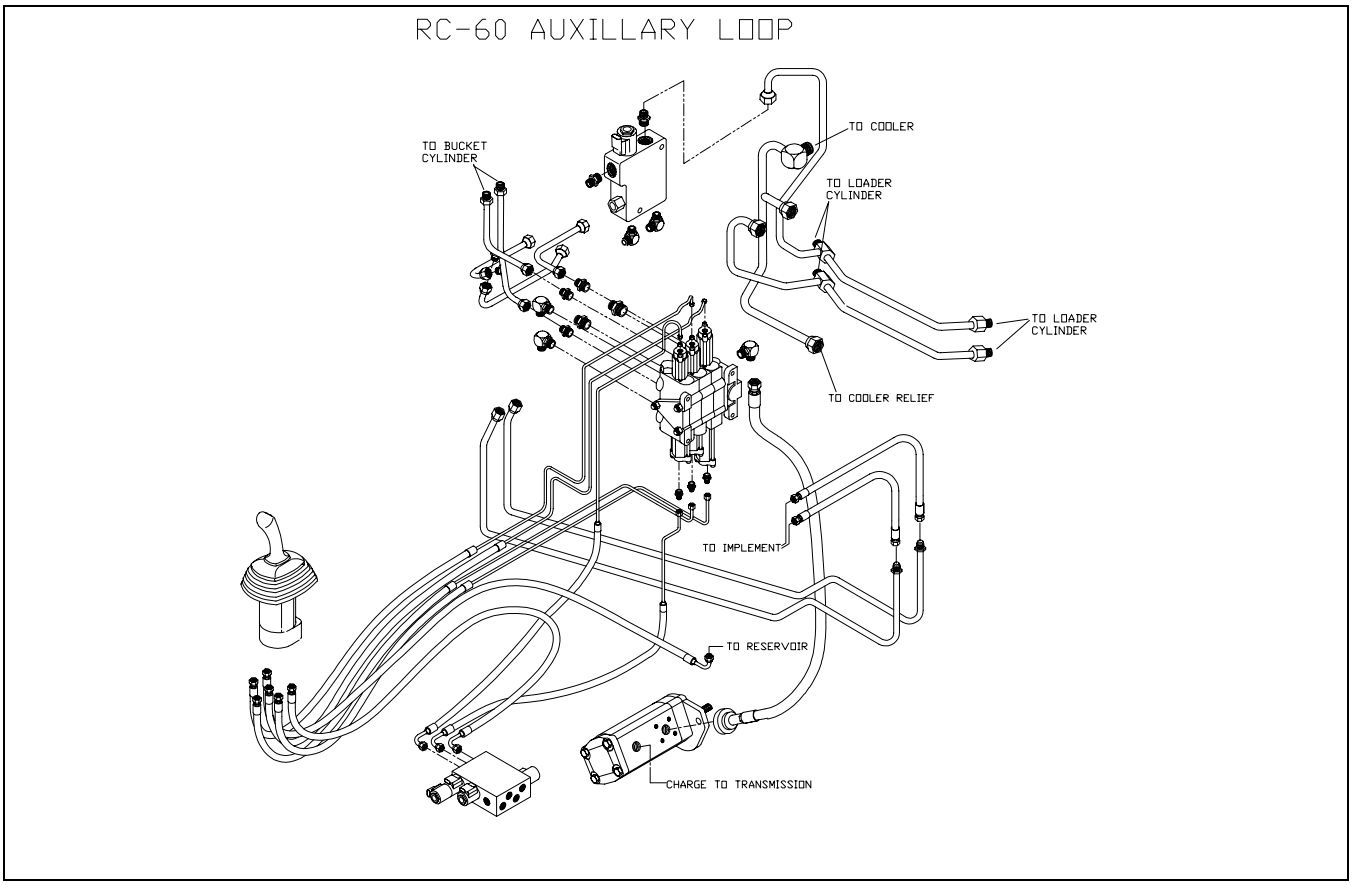
Auxiliary Circuit System (RC-60)

The auxiliary circuit system (Figure 3-2) contains the following major components.

- Loader valve
- Pilot control manifold
- Auxiliary gear pump
- Loader control joystick

Figure 3-2

RC-60 Auxiliary Circuit System 3-002



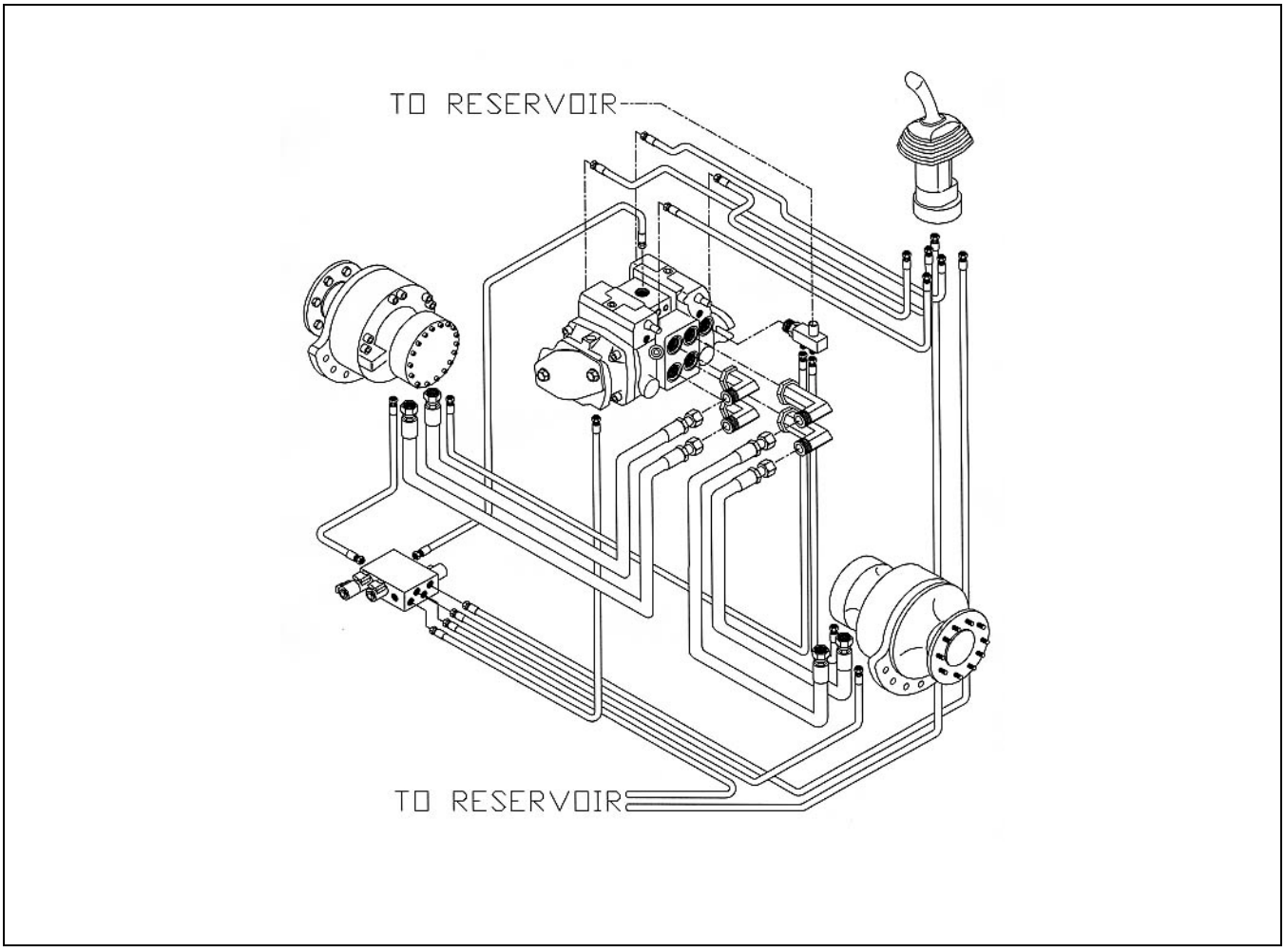
Drive Loop System (RC-60)

The drive loop system (Figure 3-3) contains the following major components.

- Drive motors
- Pilot control manifold
- Drive control joystick
- Tandem Pump

Figure 3-3

RC-60 Drive Loop System 3-003



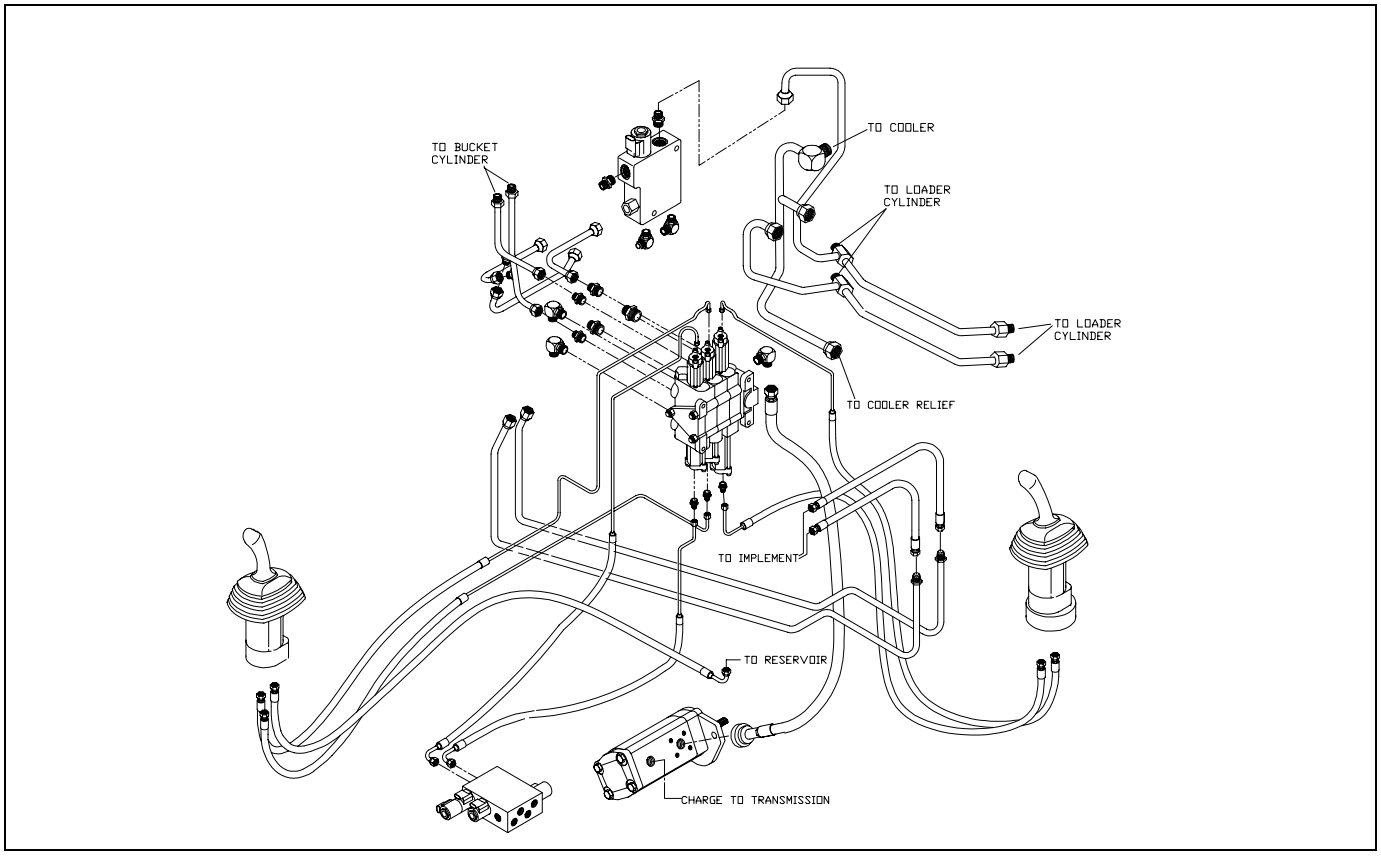
Auxiliary Circuit System (RC-60 with optional Case controls)

The auxiliary circuit system (Figure 3-2) contains the following major components.

- Loader valve
- Pilot control manifold
- Auxiliary gear pump
- Loader control joysticks

Figure 3-4

Auxiliary Circuit System



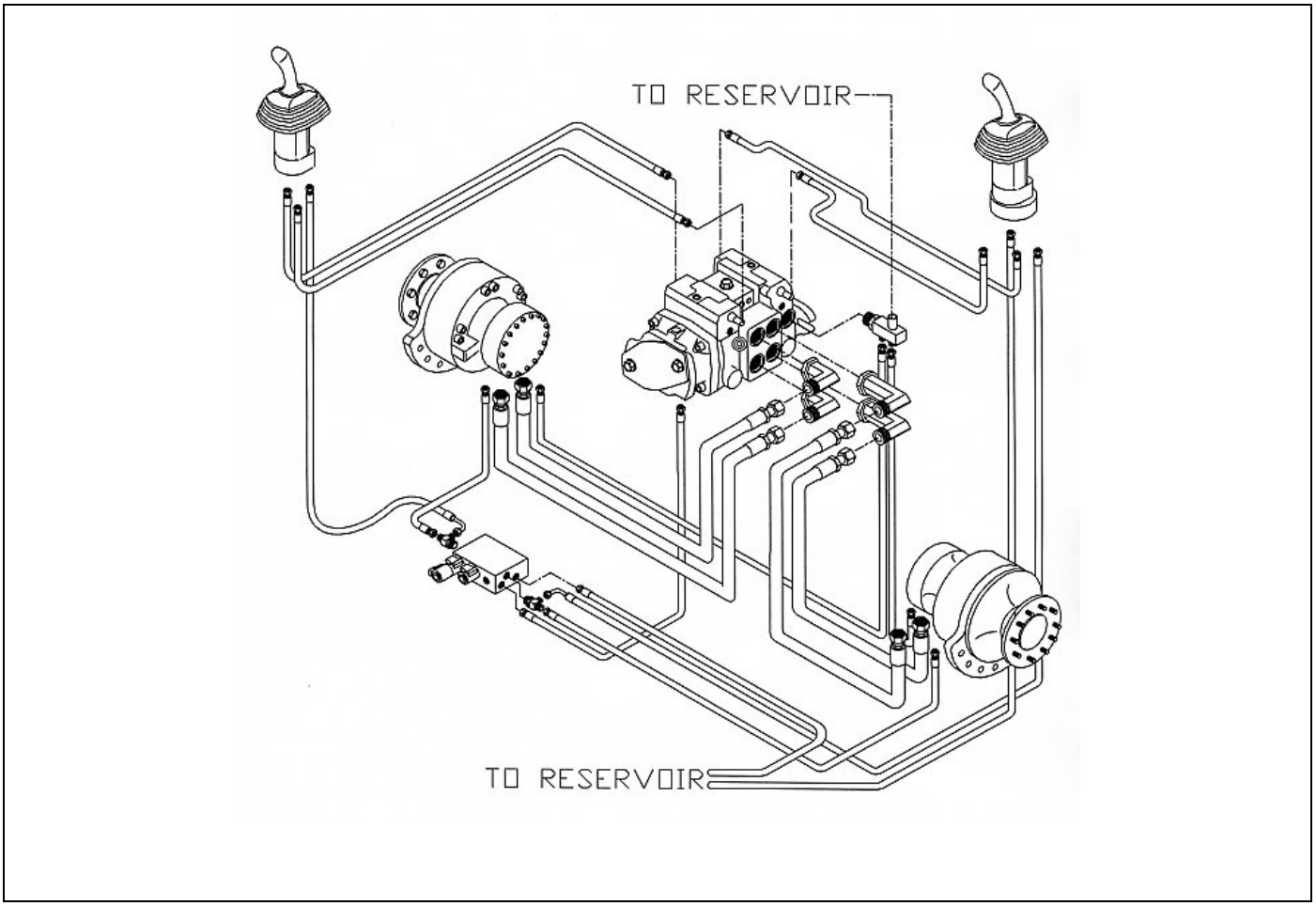
Drive Loop System

The drive loop system (Figure 3-3) contains the following major components.

- Tandem pump
- Drive motors
- Pilot control manifold
- Drive control joysticks

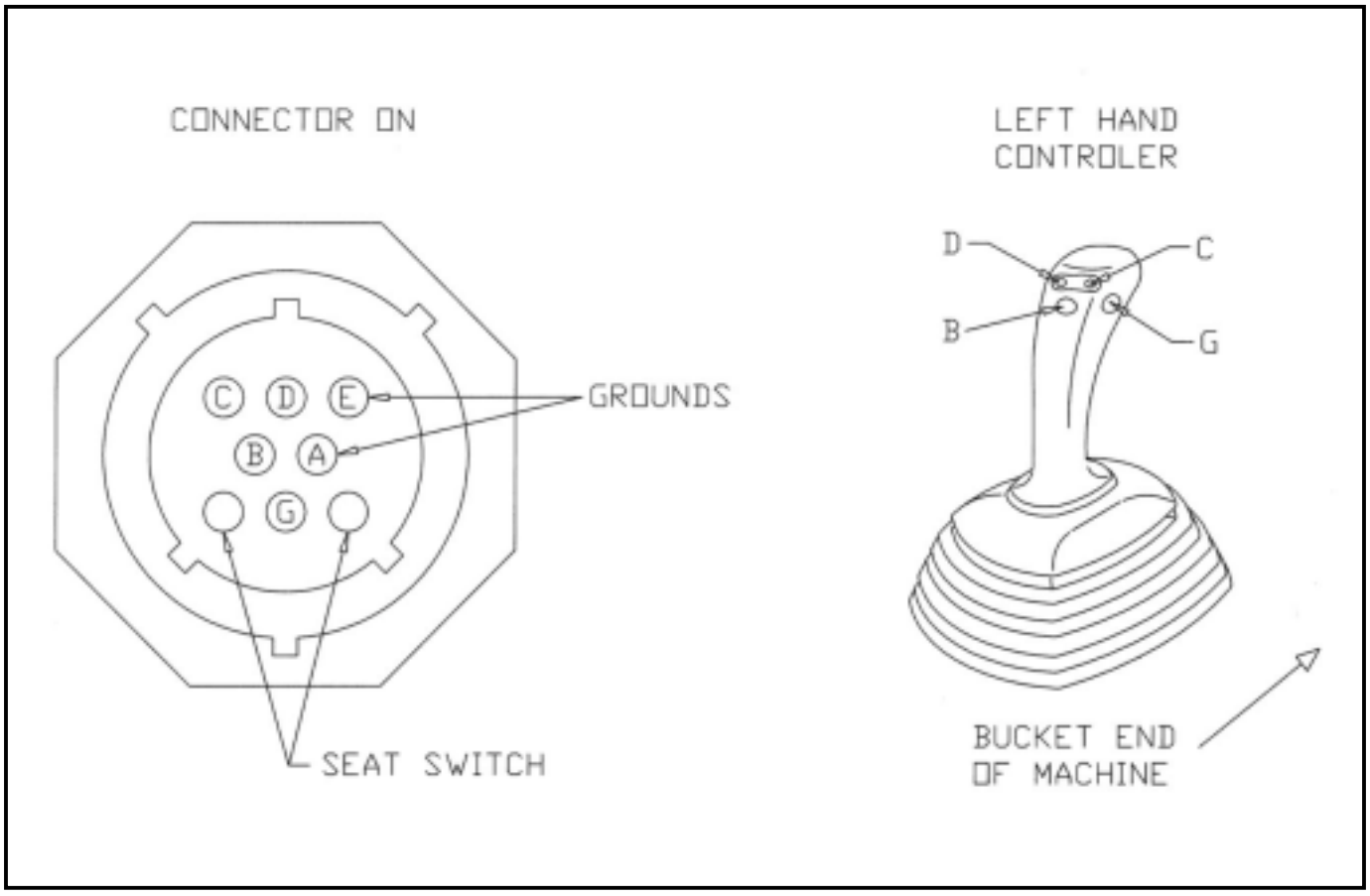
Figure 3-5

Drive Loop System



Electrical Attachment Outlet

Figure 3-6 RC-60 Electrical Attachment Outlet



4. Machine Controls and Instrumentation

Chapter Overview

This chapter contains an overview of the machine controls and instrumentation. It includes an illustration of the following controls and instrumentation components and a description of their functions.

- Machine controls
- Dash panel
- Gauge/warning light panel

Machine Controls

There are three primary machine controls: loader & drive control (1&2) and throttle (3).

Loader Control (RC-60)

The loader control (1) allows the operator to raise, lower and pivot the attachment using a simple, pilot-operated joystick.

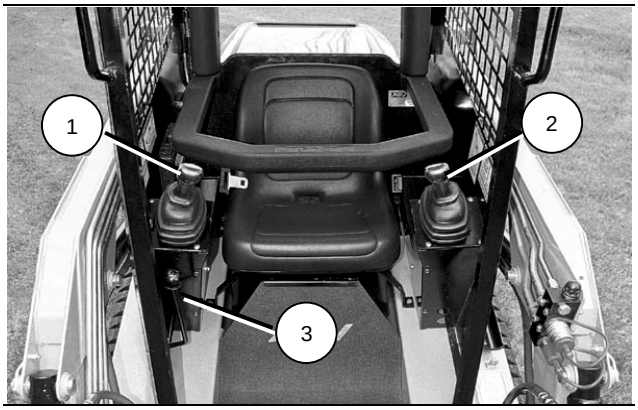


Figure 4-1 4-001

Loader Control (w/optional Case control)

The loader and bucket are controlled by the sideways motion of the controls (1&2). The right joystick operates the bucket and the left joystick operates the loader boom.

Drive Control (RC-60)

The drive control (2) allows the operator to change directions and speed using a simple, pilot-operated joystick.

Drive Control (w/optional Case control)

The forward and reverse motion of each track is controlled by the forward and back motion of the controls (1&2). The right joystick operates the right track and the left joystick operates the left track.

Throttle

The throttle controls engine rpm.

Dash Panel

The dash panel (**Error! Reference source not found.**) is positioned for easy visibility in the “heads up” position inside the operator’s enclosure. The dash panel includes the following components.

(1) Interior light

(2) Slope indicator

(3) Self-level Switch

(4) Ignition switch

(5) Gauge/warning light panel

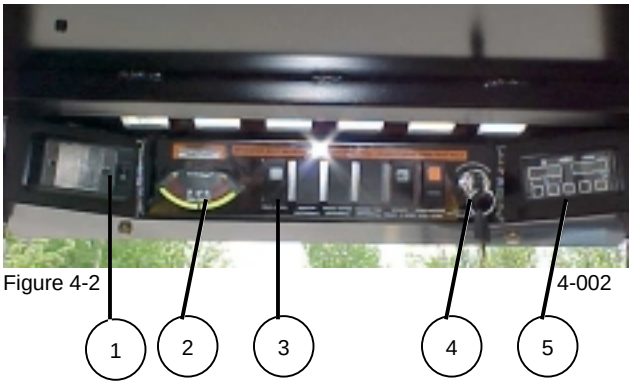


Figure 4-2 4-002

Gauge/Warning Light Panel

The gauge/warning light panel (Figure 4-2) includes the following indicator lights.

(1) Engine coolant temperature warning

(2) Glow plug operation

(3) Engine oil pressure warning

(4) Hydraulic oil temperature warning

(5) Battery low-voltage warning

(6) Fuel gauge

(7) Service hour meter

NOTICE

If the engine coolant temperature, engine oil pressure or hydraulic oil temperature lights illuminate during normal machine operation, shut the machine down immediately. Diagnose the problem and make needed repairs before continuing to operate.

NOTICE

If the battery low-voltage light illuminates, drive the machine to a suitable location and shut the engine off. Diagnose the problem and make needed repairs before continuing to operate.

The glow plug operation light illuminates only when the key switch is turned to engine pre-heat, showing normal operation.

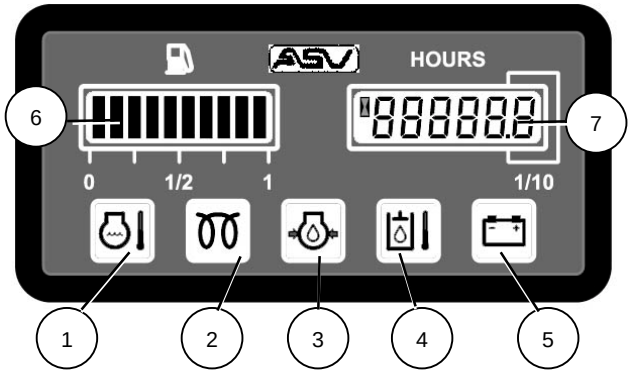


Figure 4-2 4-003

5. Operator Enclosure Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the operator enclosure assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Operator Enclosure Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following operator enclosure components.

- Light Bar
- Ignition Switch
- Console Gauge/Warning Panel
- Lap Bar Gas Assist Spring

Note: Procedures are provided for only those operator enclosure components listed above. However, information for removal and installation of other operator enclosure components can be obtained from the Rubber Track Loader Parts List manual.

Light Bar Removal and Installation

The tools required for light bar console removal and installation are listed in Table 5-1. Use manufacturer-recommended tools whenever possible.

Table 5-1

Required Tools
Combination Wrench

Light Bar Removal

Figure 5-1 5-001

1. Remove the two bolts that attach the light bar to the cab frame.

Figure 5-2 5-002

2. Carefully lower the light bar with the wire harness attached.

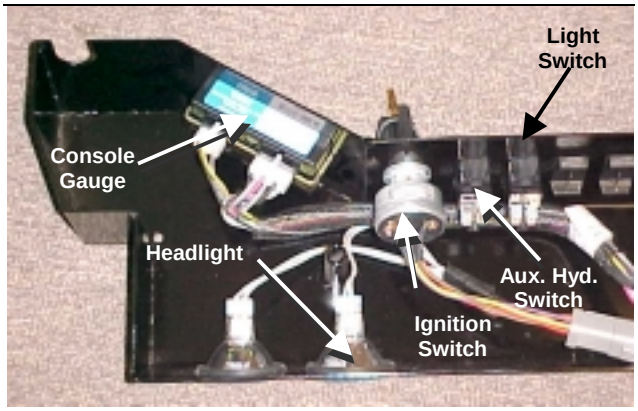


Figure 5-3 5-003

3. View of light bar interior (to operator's right when seated). Interior components are now accessible for servicing.

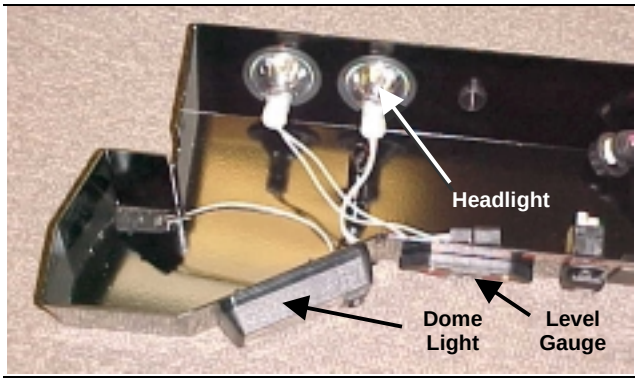


Figure 5-4 5-004

4. View of light bar interior (to operator's left when seated).

Light Bar Installation

Figure 5-5 5-005

1. Carefully position the light bar, without pinching the wiring harness against the cab frame.

Figure 5-6 5-006

2. Secure the light bar to the cab frame with the two bolts.

Ignition Switch Removal and Installation

The tools required for ignition switch removal and installation are listed in Table 5-2. Use manufacturer-recommended tools whenever possible.

Table 5-2

Required Tools
Combination Wrench

Ignition Switch Removal

1. Lower the light bar. Refer to *Chapter 5. Light Bar Removal* procedure.

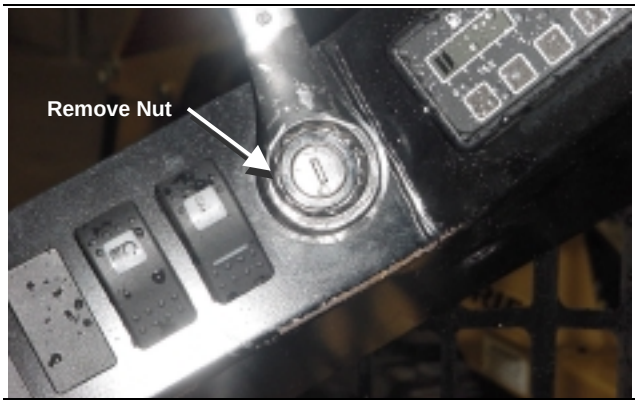


Figure 5-7 5-007

2. Remove the nut that secures the ignition switch to the dash panel.

Figure 5-8 5-008

3. Pull the ignition switch out from the rear of the dash panel.

Figure 5-9 5-009

4. Unplug the ignition switch connector.

Ignition Switch Installation

Figure 5-10 5-010

1. Insert the ignition switch from the rear of the dash panel.

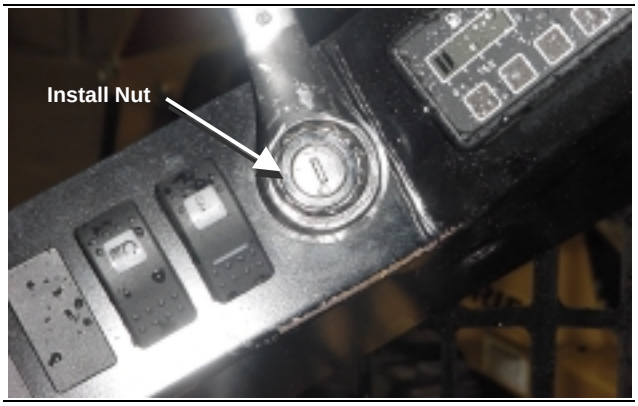


Figure 5-11 5-011

2. Install the nut that secures the ignition switch to the dash panel.

Figure 5-12 5-012

3. Plug in the ignition switch connector.

4. Install the light bar. Refer to *Chapter 5. Light Bar Installation* procedure.

Console Gauge/Warning Panel Removal and Installation

The tools required for console gauge/warning panel removal and installation are listed in Table 5-3. Use manufacturer-recommended tools whenever possible.

Table 5-3

Required Tools
Combination wrench

Console Gauge Removal

1. Lower the light bar. Refer to *Chapter 5. Light Bar Removal* procedure.

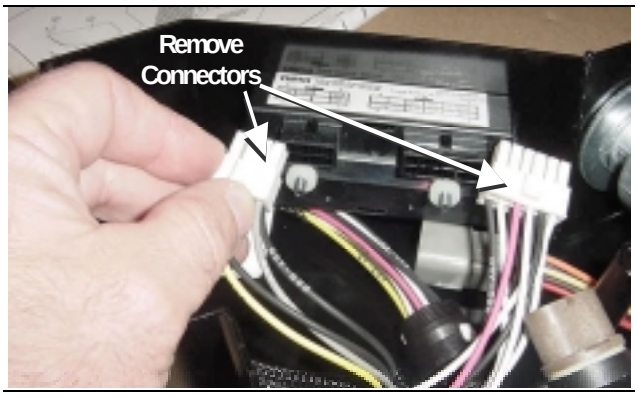


Figure 5-13 5-013

2. Remove the connectors from the console gauge.

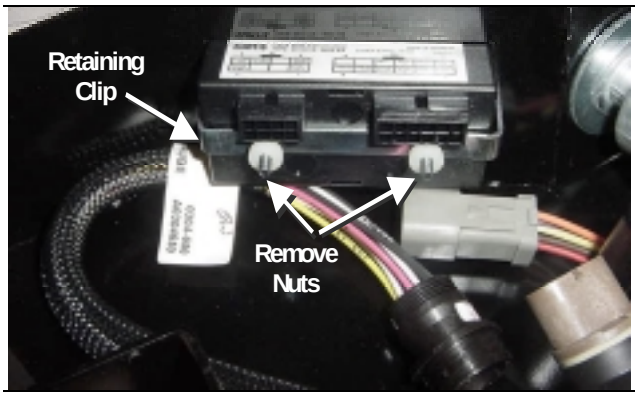


Figure 5-14 5-014

3. Remove the two nuts that secure the console gauge to the retaining clip.

Figure 5-15 5-015

4. Pull the console gauge out from the front of the dash panel.

Console Gauge Installation

Figure 5-16 5-016

1. Insert the console gauge from the front of the dash panel.

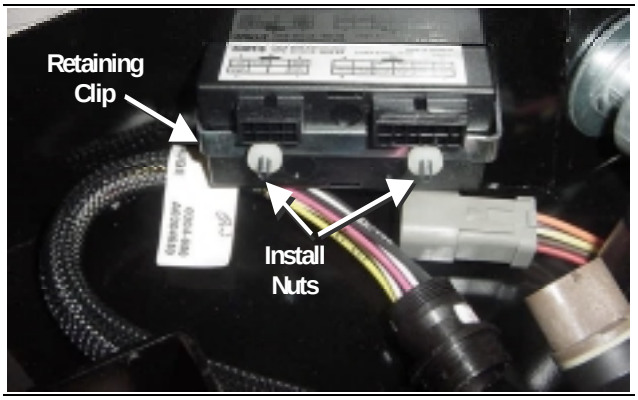


Figure 5-17 5-017

2. Install the two nuts that secure the console gauge to the retaining clip.

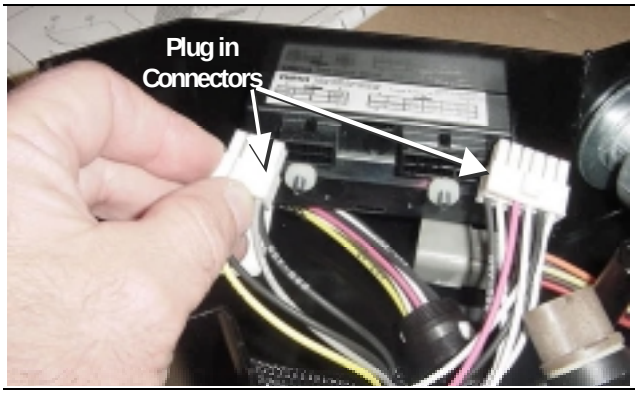


Figure 5-18 5-018

3. Plug in the console gauge connectors.

4. Install the light bar. Refer to *Chapter 5. Light Bar Installation* procedure.

Lap Bar Gas Assist Spring Removal and Installation

The tools required for gas assist spring removal and installation are listed in Table 5-4. Use manufacturer-recommended tools whenever possible.

Table 5-4

Required Tools
Screwdriver

Lap Bar Gas Assist Spring Removal

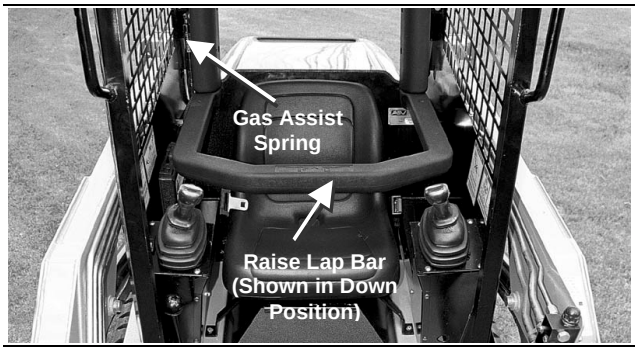


Figure 5-19 5-019

1. Put the lap bar in the UP position to relieve tension on the lap bar gas assist spring.

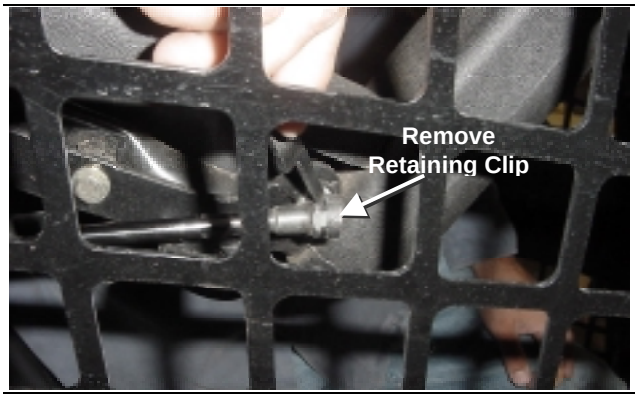


Figure 5-20 5-020

2. Using a small screwdriver, remove the retaining clip from each end of the gas assist spring.

Figure 5-21 5-021

3. Remove the gas assist spring by pulling both ends out from the ball joints.

Lap Bar Gas Assist Spring Installation

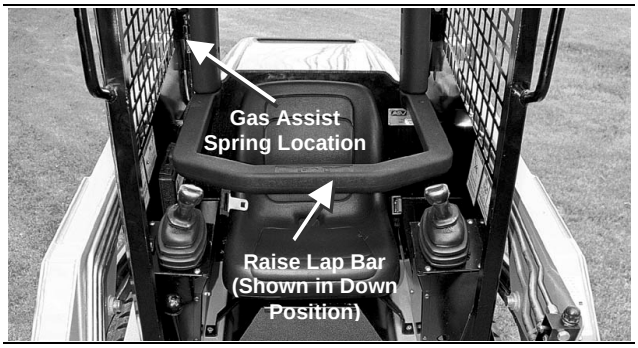


Figure 5-22 5-022

1. Put the lap bar in the UP position to minimize tension on the lap bar gas assist spring during installation.

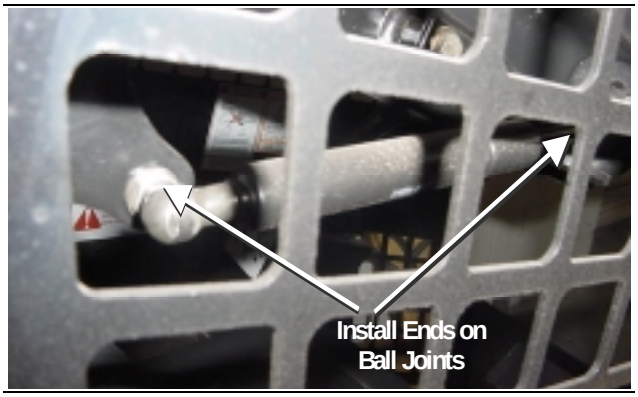


Figure 5-23 5-023

2. Install the ends of the lap bar gas assist spring onto the ball joints.

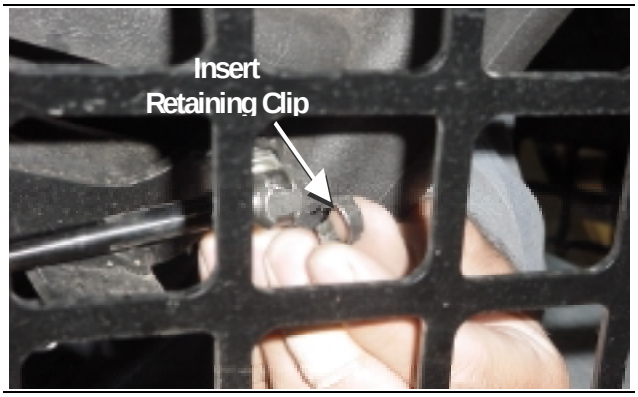


Figure 5-24 5-024

3. Slide the retaining clip on to each end of the gas assist spring.

6. Seat & Fuel Sender Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the chassis assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Chassis Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following chassis components.

- Seat
- Fuel Sending Unit
- Fuel Sending Unit Hose
- In-Tank Weight

N**ote:** Procedures are provided for only those chassis components listed above. However, information for removal and installation of other chassis components can be obtained from the exploded view illustration provided in the Rubber Track Loader Parts List manual.

Seat Removal and Installation

The tools required for seat removal and installation are listed in Table 6-1. Use manufacturer-recommended tools whenever possible.

Table 6-1

Required Tools
Socket Wrench

Seat Removal

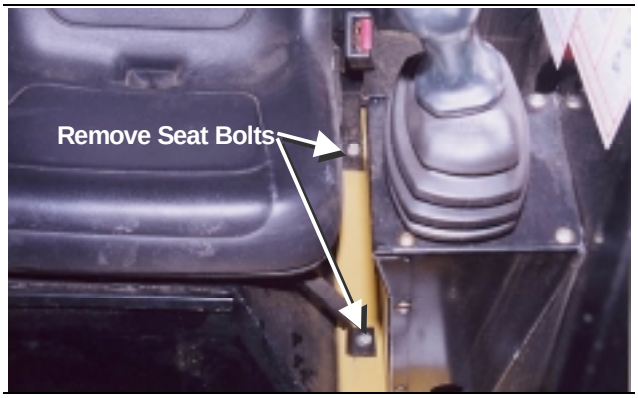


Figure 6-1 6-001

1. Remove the four nuts that fasten the seat mounts to the frame.

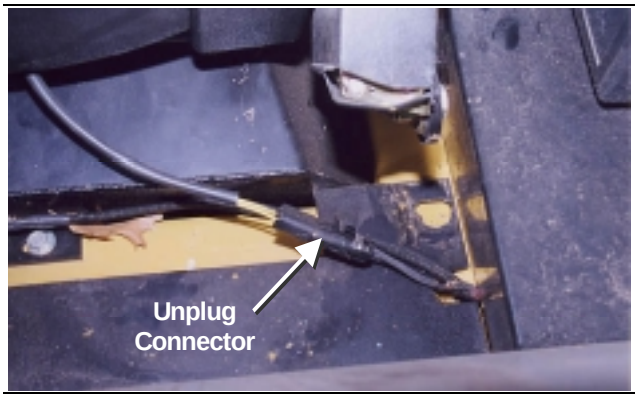


Figure 6-2 6-002

2. Tilt the seat forward and reach behind the seat to unplug the seat switch wiring harness.

Figure 6-3 6-003

3. Remove the seat. Be careful not to scratch the control panel or sides of the cab.

Seat Installation

Figure 6-4 6-003

1. With the seat mounts attached, place the seat in the cab. Be careful not to scratch the control panel or sides of the cab.

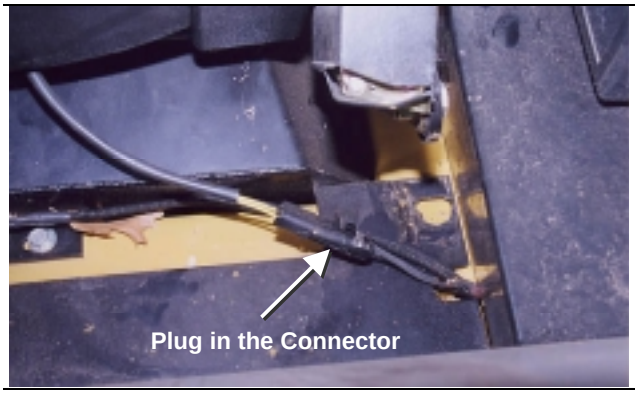


Figure 6-5 6-002

2. Tilt the seat forward and reach behind the seat to plug in the seat switch connector

Note: The machine will not operate unless the seat switch connector is plugged in.

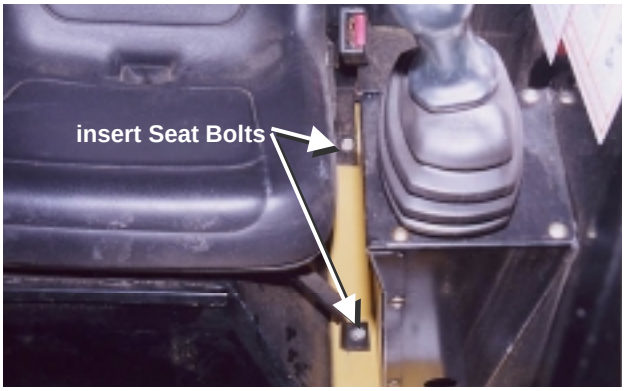


Figure 6-6 6-001

3. Position the seat so the holes in the seat mounts are aligned with the bolts in the frame. Install the four seat mount nuts and washers.

Fuel-Sending Unit Removal and Installation

The tools required for fuel sending unit removal and installation are listed in Table 6-2. Use manufacturer-recommended tools whenever possible.

Table 6-2

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Fuel Sending Unit Removal

1. Remove the seat. Refer to *Chapter 6. Seat Removal* procedure.
2. Pump fuel from the tank until there is no fuel remaining above the sending unit.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Figure 6-7 6-004

3. Remove the hoses and wires from the fuel-sending unit, then remove the screws that fasten the unit to the tank. Mark the wires and hoses.

Note: If the fuel sending unit wires are crossed, the fuel gauge will not work. If the hoses are crossed, the engine will not run.

Figure 6-8 6-005

4. Remove the fuel-sending unit. Be careful not to damage the float mechanism when pulling it through the opening in the fuel tank.

Figure 6-9 6-006

5. The fuel pickup line will also come out with the fuel-sending unit.

Fuel Sending Unit Installation

Figure 6-10 6-006

1. Insert the fuel pickup line into the fuel tank opening. The pickup line is attached to the fuel-sending unit.

Note: The weight on the end of the fuel pickup line must rest on the bottom of the tank for proper operation.

2. Insert the fuel sending unit float mechanism into the fuel tank opening. Be careful not to damage the float when pushing it through the opening.

Note: Make sure that the wire on the sending unit is not bent and the fuel pickup line does not interfere with the movement of the float.

3. Connect the hoses and wires to the fuel-sending unit, and then install the screws that fasten the unit to the tank.

Note: Be careful not to cross the wires or hoses. If the fuel sending unit wires are crossed, the fuel gauge will not work. If the hoses are crossed, the engine will not run.

4. Install the seat. Refer to *Chapter 6. Seat Installation* procedure.

7. Radiator/Oil Cooler Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the radiator/oil cooler assembly. Adjustment procedures are also included for selected radiator/oil cooler components.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Radiator/Oil Cooler Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following radiator/oil cooler components.

- Fan Guard
- Radiator/Cooler

N**ote:** Procedures are provided for only those radiator/oil cooler components listed above. However, information for removal and installation of other radiator/oil cooler components can be obtained from the Rubber Track Loader Parts List manual.

N**ote:** Refer to Figure 3-1 for an overview of the filtering and cooling system.

Fan Guard Removal and Installation

The tools required for fan guard removal and installations are listed in Table 7-1. Use manufacturer-recommended tools whenever possible.

Table 7-1

Required Tools
Combination Wrench

Fan Guard Removal

Figure 7-1 7-001

1. Remove the bolts that secure the fan guard to the fan shroud.
2. Remove the fan guard from the engine compartment.

Fan Guard Installation

1. Position the fan guard over the fan and against the fan shroud.
2. Install the capscrews that secure the fan guard to the fan guard mounts.

Radiator/Cooler Removal and Installation

The tools required for radiator/cooler removal and installations are listed in Table 7-2. Use manufacturer-recommended tools whenever possible.

Table 7-2

Required Tools
Combination Wrench
Socket Wrench
Screwdriver

Radiator/Cooler Removal

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

! WARNING !

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to the heaters and the engine contain hot coolant and steam. Contact can cause severe burns.

Remove the filler cap slowly to relieve pressure only when the engine is stopped and the radiator cap is cool enough to touch with your bare hand.

Do not attempt to tighten the hose connections when the coolant is hot. The hose can come off and cause burns.

Cooling system conditioner contains alkali. Avoid contact with skin and eyes.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

1. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change*.

Figure 7-2 7-008

2. Drain the coolant using the petcock on the bottom of the radiator.

Figure 7-3 7-010

3. Remove the lower hose from the oil cooler section. Cap the hose and fitting.

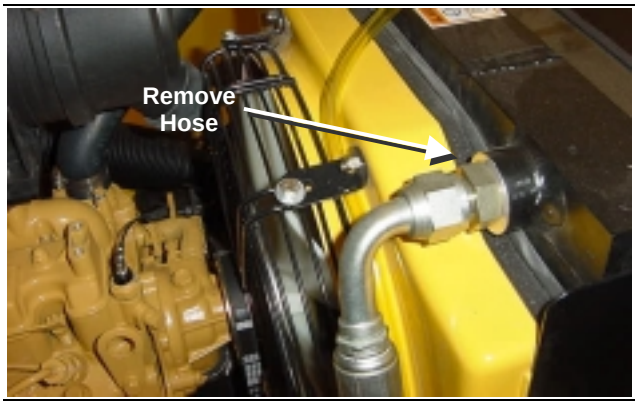


Figure 7-4 7-002

4. Remove the upper hose from the oil cooler section. Cap the hose and fitting.

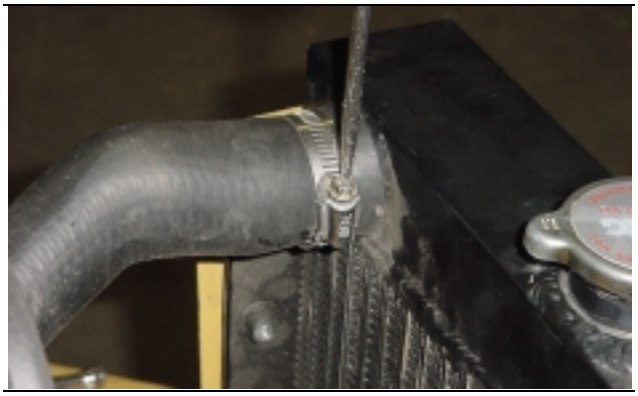


Figure 7-5 7-011

5. Remove the upper hose from the radiator section. Cap the hose and fitting.

Figure 7-6 7-012

6. Remove the lower hose from the radiator section. Cap the hose and fitting.

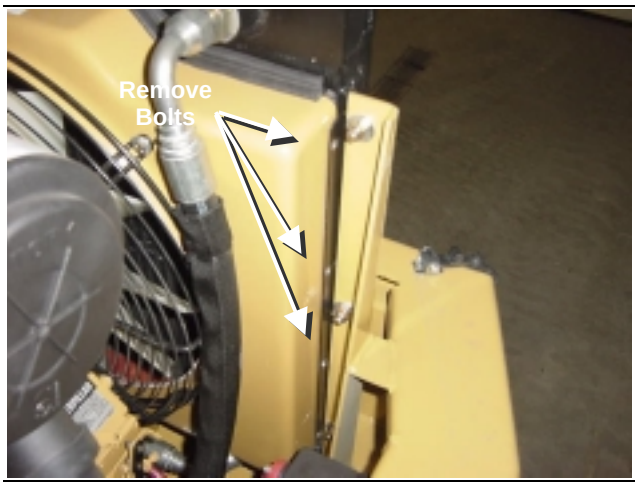


Figure 7-7 7-003

7. Remove the three mounting bolts on each side of the radiator/cooler.

Figure 7-8 7-013

8. Remove the radiator/cooler from the engine compartment.

Radiator/Cooler Installation

Figure 7-9 7-013

1. Install the engine shroud, and position the radiator/cooler in the engine compartment.

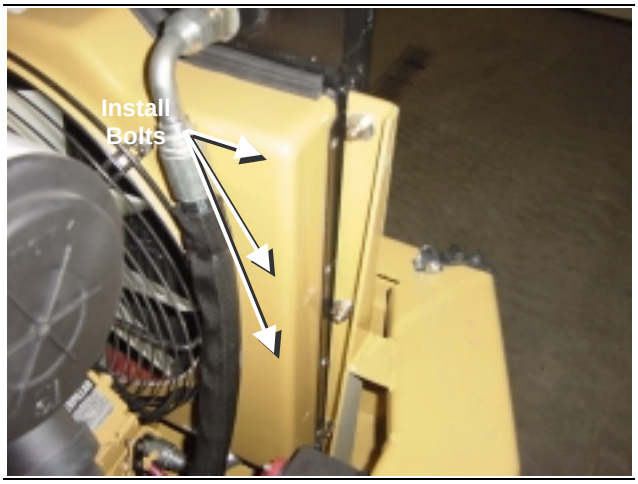


Figure 7-10 7-003

2. With the radiator/cooler in position, install the three mounting bolts on each side of the radiator/cooler.

Figure 7-11 7-012

3. Remove the hose and fitting caps and install the lower hose on the radiator section.

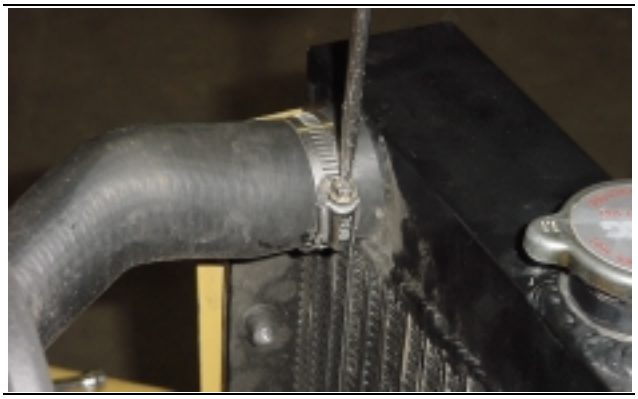


Figure 7-12 7-011

4. Remove the hose and fitting caps and install the upper hose on the radiator section.

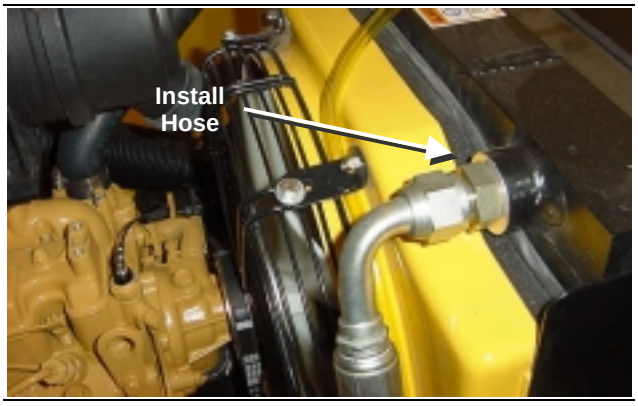


Figure 7-13 7-002

5. Remove the hose and fitting caps and install the upper hose on the oil cooler section.

Figure 7-14 7-010

6. Remove the hose and fitting caps and install the lower hose on the oil cooler section.

7. Close the petcock and fill the radiator with coolant and the hydraulic reservoir with oil.

8. Hydraulic Reservoir Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the hydraulic reservoir assembly. Cleaning procedures are also included for the hydraulic reservoir.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Hydraulic Reservoir Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following hydraulic reservoir components.

- Filter Assembly
- Access Cover Assembly
- Reservoir Gauge
- Suction Screen

Note: Procedures are provided for only those hydraulic reservoir components listed above. However, information for removal and installation of other hydraulic reservoir components can be obtained from the Rubber Track Loader Parts List manual.

Note: Refer to Figure 3-1 for an overview of the filtering and cooling system.

Filter Manifold Assembly Removal and Installation

The tools required for filter assembly removal and installation are listed in Table 8-1. Use manufacturer-recommended tools whenever possible.

Table 8-1

Required Tools
Combination Wrench

Note: Refer to Chapter 14, Maintenance, for procedures on changing the hydraulic filter element.

Filter Manifold Assembly Removal

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

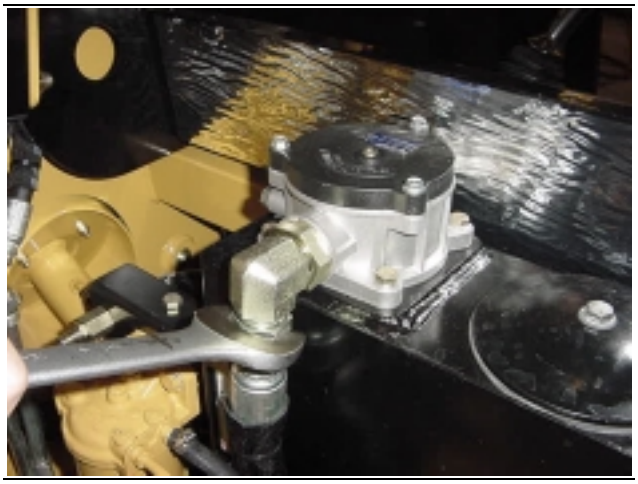


Figure 8-1 8-001

1. Remove the hose from the filter manifold assembly. Cap hose and fitting.

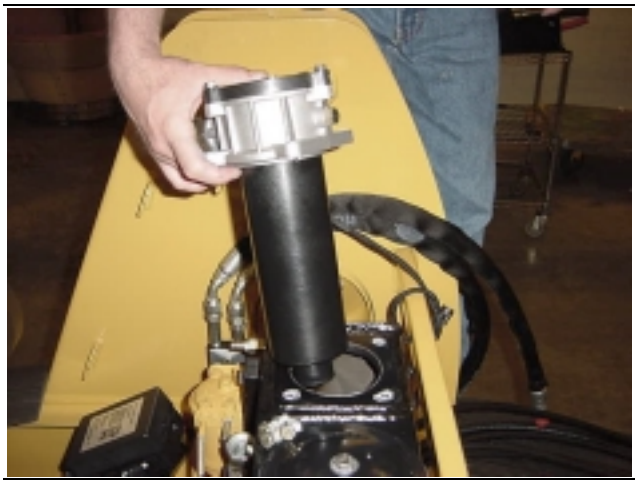


Figure 8-2 8-002

2. Remove the four bolts which fasten the filter manifold to the hydraulic reservoir.
3. Remove the filter manifold assembly. Reverse steps for intstallation.

Access Cover Removal and Installation

The tools required for access cover removal and installation are listed in Table 8-2. Use manufacturer-recommended tools whenever possible.

Table 8-2

Required Tools
Combination Wrench

Access Cover Assembly Removal

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

Figure 8-3 8-012

1. Slightly loosen the access cover bolt to separate the upper cap from the oval-shaped clamping disk on the underside of the assembly. This will allow the assembly to be removed. Do not remove the bolt entirely or the oval-shaped clamp will fall into the reservoir.

Figure 8-4 8-013

2. Remove the access cover assembly from the reservoir.

Access Cover Assembly Installation

Figure 8-5 8-013

1. Insert the access cover assembly with the clamping disk extending completely through the opening in the top of the reservoir and into the tank.

Figure 8-6 8-012

2. Tighten the access cover bolt.

Reservoir Gauge Removal and Installation

The tools required for reservoir gauge removal and installation are listed in Table 8-3. Use manufacturer-recommended tools whenever possible.

Table 8-3

Required Tools
Combination Wrench

Reservoir Gauge Removal

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Drain the hydraulic fluid. Refer to *Chapter 14. Maintenance.*

2. Remove the filter manifold. Refer to *Chapter 8. Filter Assembly Removal*.

Figure 8-7 8-016

3. View of hydraulic reservoir with filter assembly removed.

Figure 8-8 8-017

4. Reach inside the reservoir and remove the two nuts that fasten the reservoir gauge to the reservoir.

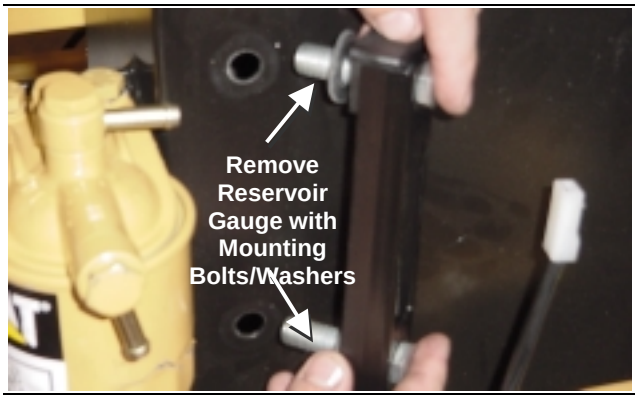


Figure 8-9 8-018

5. Pull the reservoir gauge and the two mounting bolts/washers off the reservoir. **DO NOT misplace the rubber washers or the reservoir will leak.**

Reservoir Gauge Installation

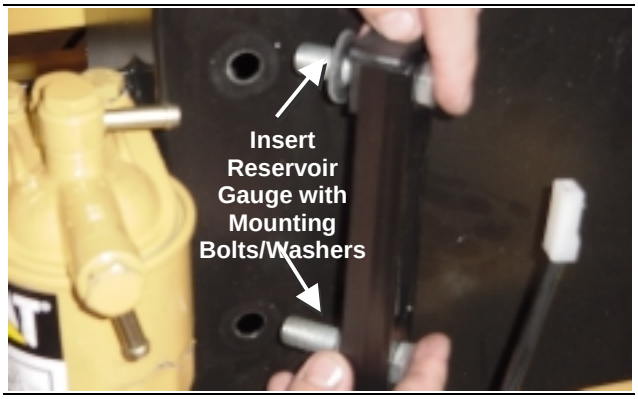


Figure 8-10 8-018

1. Install the reservoir gauge in the reservoir using the two mounting bolts/washers.

Figure 8-11 8-017

2. Reach inside the reservoir and install the two nuts that secure the reservoir gauge to the reservoir.

3. Install the filter assembly. Refer to *Chapter 8. Filter Assembly Installation*.

4. Add manufacturer-approved hydraulic fluid.

Suction Screen Removal and Installation

The tools required for suction screen removal and installation are listed in Table 8-4. Use manufacturer-recommended tools whenever possible.

Table 8-4

Required Tools
Combination Wrench

Suction Screen Removal

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: It is normally not necessary to replace the suction screen unless there has been a catastrophic failure and there is debris in the reservoir.

1. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change.*

2. Remove the access cover assembly. Refer to *Chapter 8. Access Cover Assembly Removal*.

Figure 8-12 8-014

3. With a magnet centered in an absorbent rag, thoroughly clean the interior of the reservoir to prevent any debris from entering the system when you remove the suction filter.

Figure 8-13 8-015

4. Reach inside the reservoir and unscrew the suction screen. Remove the suction screen from the reservoir.

Suction Screen Installation

Figure 8-14 8-015

1. Insert the suction screen in the reservoir through the access cover opening.

2. Reach inside the reservoir and screw the suction screen into the bottom of the reservoir.

3. Install the access cover assembly. Refer to *Chapter 8. Access Cover Assembly Installation*.

4. Add manufacturer-approved hydraulic fluid.

Hydraulic Reservoir Cleaning Procedures

Cleaning procedures are provided for the following hydraulic reservoir components.

- Hydraulic Reservoir

Hydraulic Reservoir Cleaning

The tools required for hydraulic reservoir cleaning are listed in Table 8-5. Use manufacturer-recommended tools whenever possible.

Table 8-5

Tool Name
Combination Wrench

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

1. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change*.
2. Remove the access cover assembly. Refer to *Chapter 8. Access Cover Assembly Removal*.
3. Thoroughly wipe out the interior of the hydraulic reservoir with a magnet and a clean rag.
4. Install the access cover assembly. Refer to *Chapter 8. Access Cover Assembly Installation*.
5. Add manufacturer-approved hydraulic fluid.

9. Loader/Transmission Controls Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the loader/transmission controls assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Loader/Transmission Controls Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following loader/transmission control components.

- Left Control Joystick
- Right Control Joystick
- Loader Float Magnet
- Loader Valve

Note: Procedures are provided for only those loader/transmission control components listed above. However, information for removal and installation of other loader/transmission control components can be obtained from the Rubber Track Loader Parts List manual.

Note: Refer to Chapter 3 for an overview of the auxiliary circuit system and drive loop system.

Joystick Removal and Installation

There are two joysticks that control the operation of the machine.

Required Tools
Screwdriver
Open End Wrench

Right Joystick Removal

Note: Since the procedures for removing both joystick controls are identical, only the right control joystick procedure is described below.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

! WARNING !

Lower all attachments and make sure the oil is cool before removing any components or lines. Hot oil can cause personal injury.

1. Lower the lift arms to the ground.

2. Turn the engine switch to the OFF position, and disconnect the battery.

3. Relieve hydraulic pressure from the auxiliary circuit.

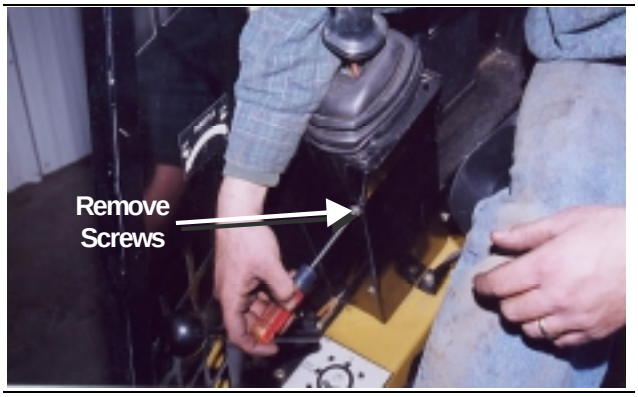


Figure 9-1 9-001

4. Remove the four retaining screws from the side cover.

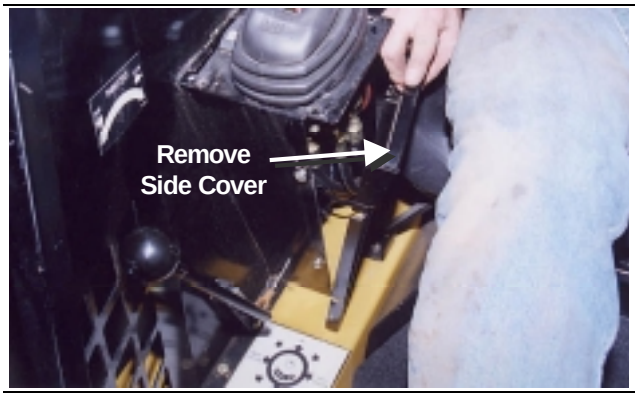


Figure 9-2 9-002

5. Remove the joystick side cover.

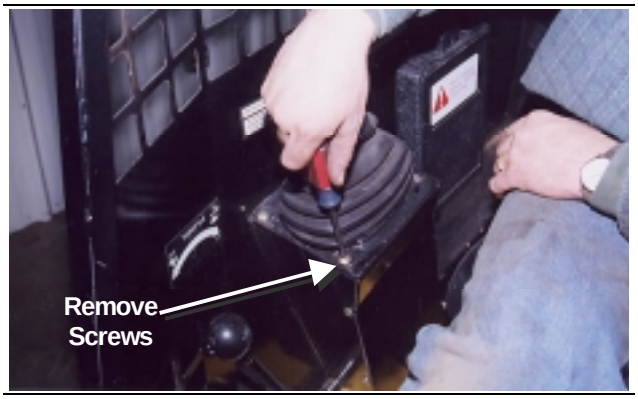


Figure 9-3 9-003

6. Remove the four retaining screws from the top cover.

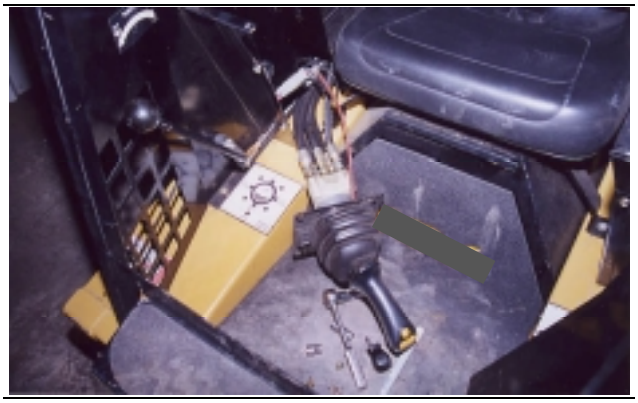


Figure 9-4 9-004

7. Pull the joystick out of the console. The mounting plate, wiring harness and hoses will stay connected to the joystick.

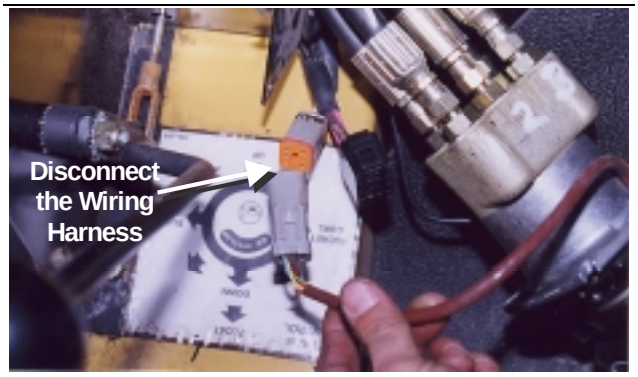


Figure 9-5 9-005

8. Disconnect the joystick wiring harness.

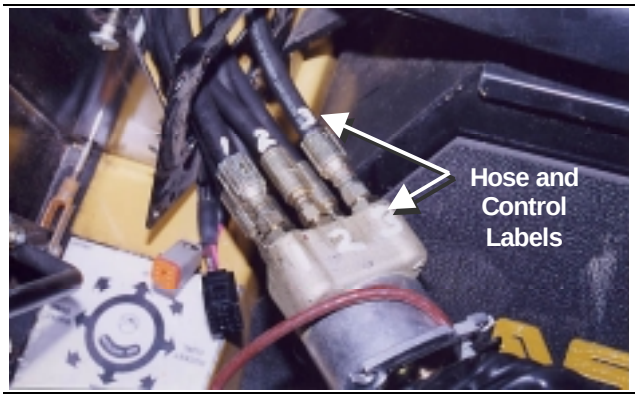


Figure 9-6 9-006

9. The hoses and the control are labeled at the factory. Make sure the labels are still legible.

10. Remove the hoses.

Joystick Installation

Note: Since the procedures for installing both joystick controls are identical, only the right control joystick procedure is described below.

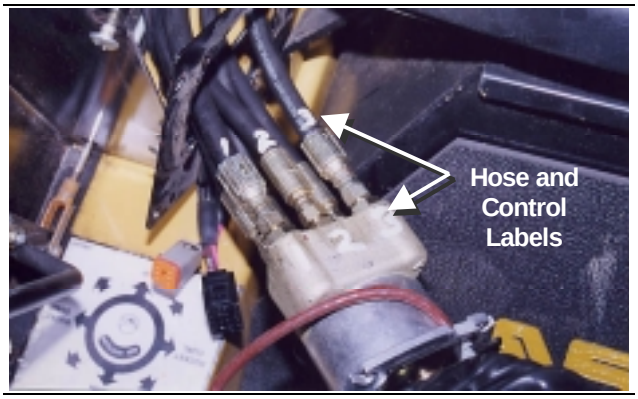


Figure 9-7 9-006

1. Match the factory labels on the hoses and the control.

2. Connect the hoses.

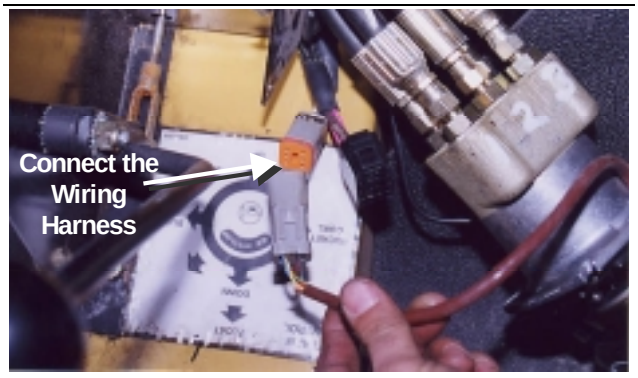


Figure 9-8 9-005

3. Connect the joystick wiring harness.

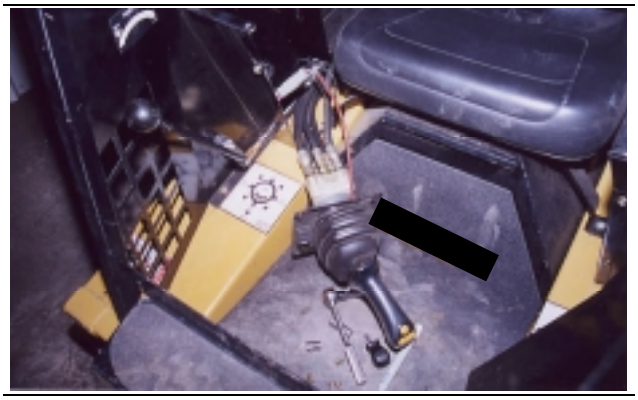


Figure 9-9 9-004

4. With the mounting plate, wiring harness and hoses installed, the control is ready to mount in the console.

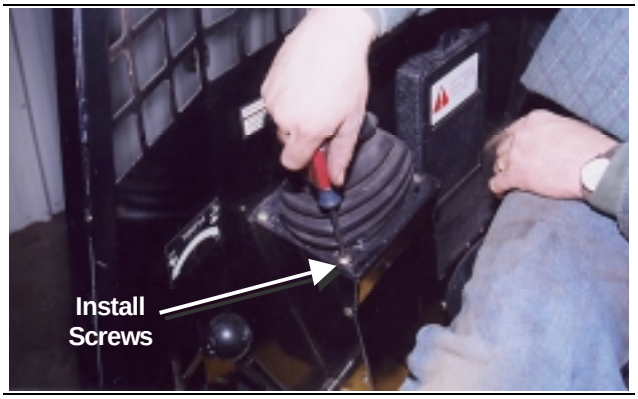


Figure 9-10 9-003

5. Position the control on top of the console and install the four retaining screws in the top cover.

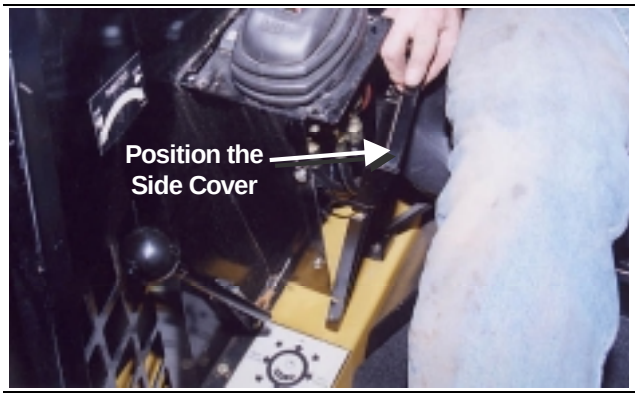


Figure 9-11 9-002

6. Place the side cover in position on the console.

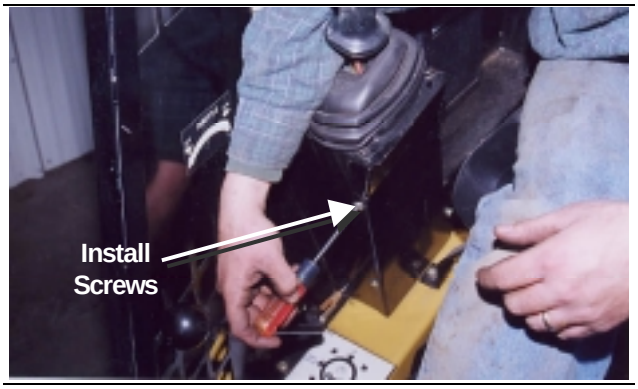


Figure 9-12 9-001

7. Install the four retaining screws in the side cover.

Loader Float Magnet Removal and Installation

The tools required for loader float magnet removal and installations are listed in Table 9-1. Use manufacturer-recommended tools whenever possible.

Table 9-1

Required Tools
Screwdriver
Open End Wrench
Allen Wrench

Loader Float Magnet Removal

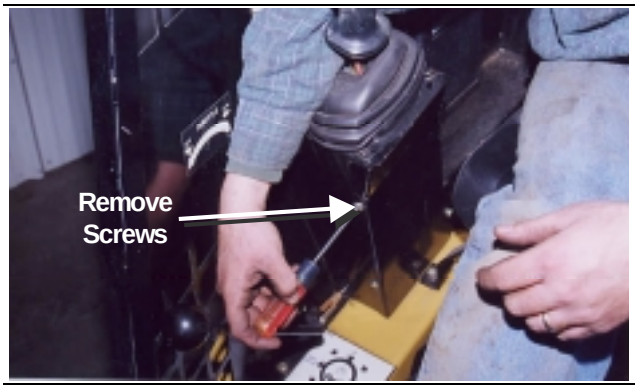


Figure 9-13 9-001

1. Remove the four retaining screws from the side cover.

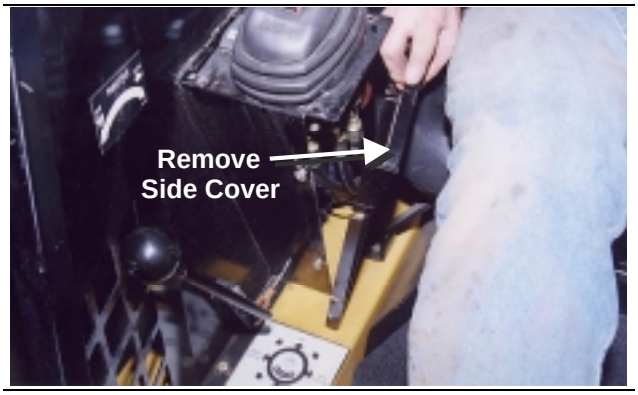


Figure 9-14 9-002

2. Remove the joystick side cover.

Figure 9-15 9-003

3. Remove the four retaining screws from the top cover.

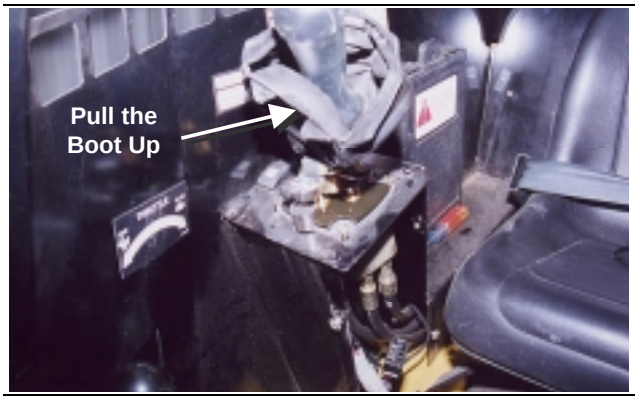


Figure 9-16 9-007

4. Remove the rubber boot from the base of the joystick and pull the boot up.

Figure 9-17 9-008

5. Remove the control from the console and locate the loader float magnet at the front of the control.

Figure 9-18 9-009

6. The loader float magnet is held in place by an allen screw at the bottom of the magnet. Remove this screw.

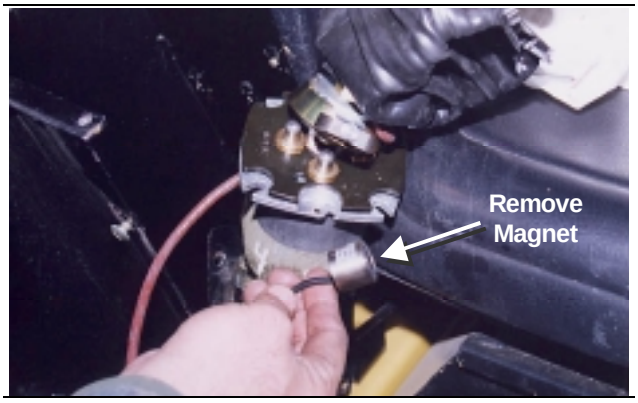


Figure 9-19 9-010

7. Remove the loader float magnet.

Loader Float Magnet Installation

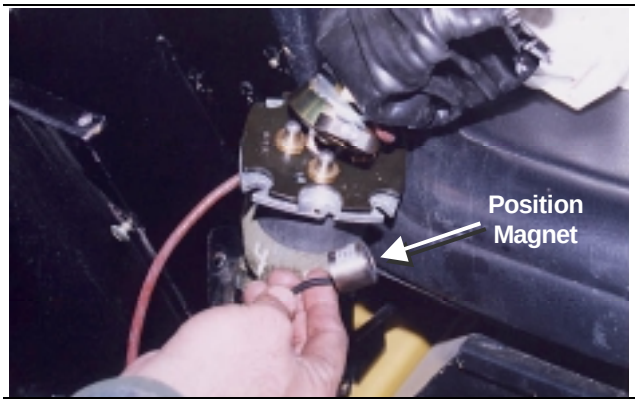


Figure 9-20 9-010

1. Position the loader float magnet at the front of the control.

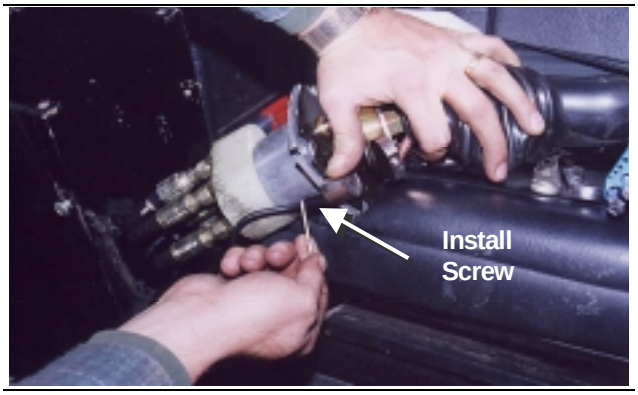


Figure 9-21 9-009

2. The loader float magnet is held in place by an allen screw at the bottom of the magnet. Install this screw.

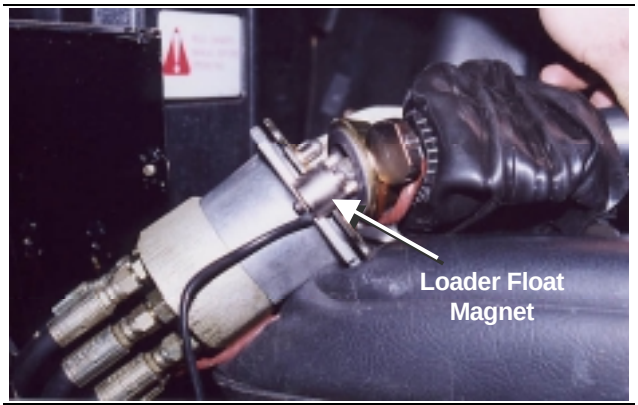


Figure 9-22 9-008

3. With the loader float magnet installed, the control is ready to mount in the console.

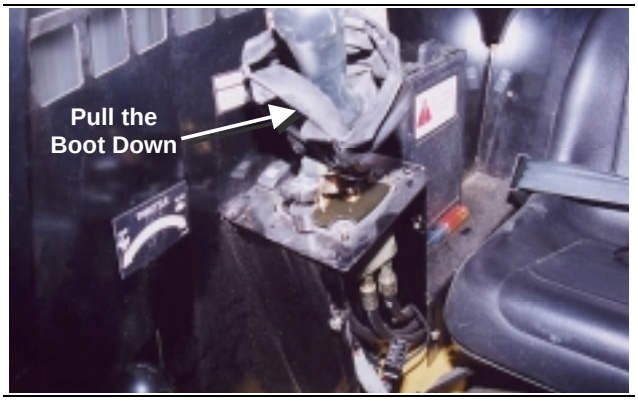


Figure 9-23 9-007

4. Position the control on the console and pull the rubber boot down over the base of the joystick.

Figure 9-24 9-003

5. Install the four retaining screws in the top cover.

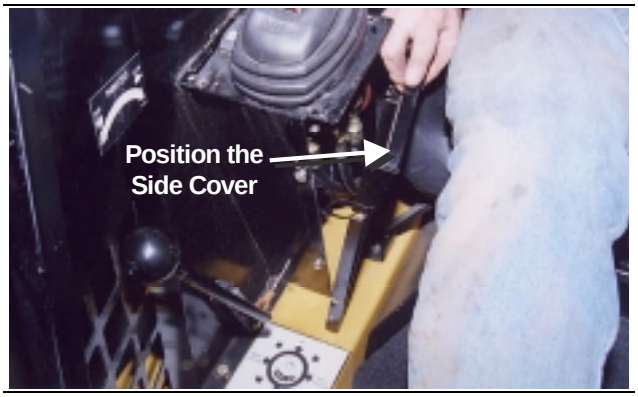


Figure 9-25 9-002

6. Place the side cover in position on the console.

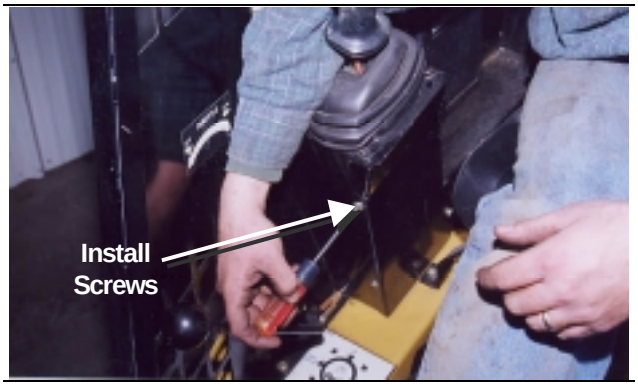


Figure 9-26 9-001

7. Install the four retaining screws in the side cover.

Loader Valve Removal and Installation

The tools required for loader valve removal and installation are listed in Table 9-2. Use manufacturer-recommended tools whenever possible.

Table 9-2

Required Tools
Combination Wrench

Loader Valve Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your hands.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the lift arms to the ground.

2. Turn the engine start switch to the OFF position.

3. Relieve hydraulic pressure from the auxiliary circuit.

4. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change.*

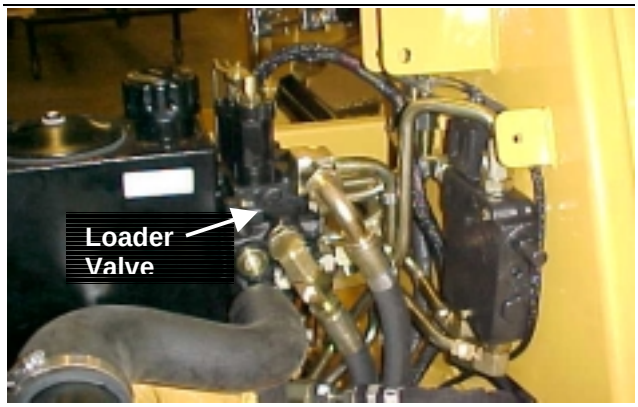


Figure 9-27 9-011

5. Locate the loader valve, which is mounted on the side of the hydraulic reservoir.

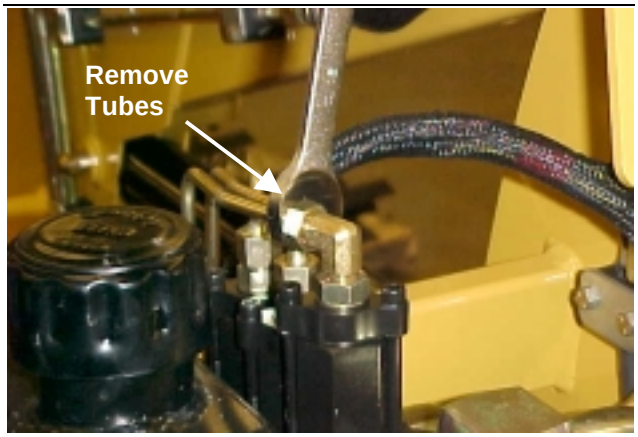


Figure 9-28 9-012

6. Remove the tubes from the top of the loader valve. Cap the tubes and fittings.

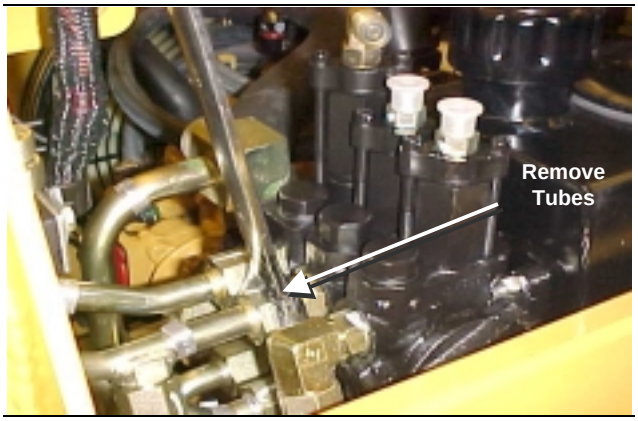


Figure 9-29 9-013

7. Remove the tubes from the side of the loader valve. Cap the tubes and fittings.

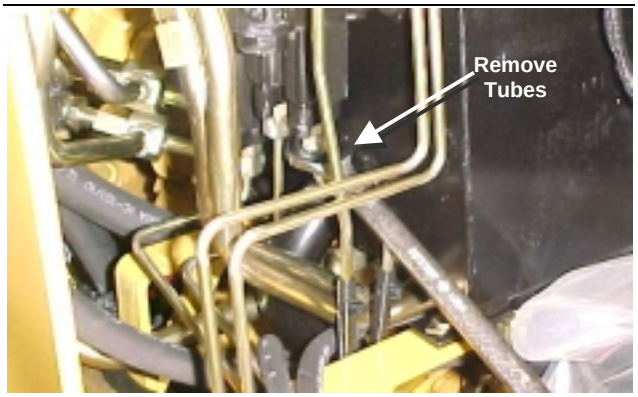


Figure 9-30 9-014

8. Remove the tubes from the bottom of the loader valve. Cap the tubes and fittings.

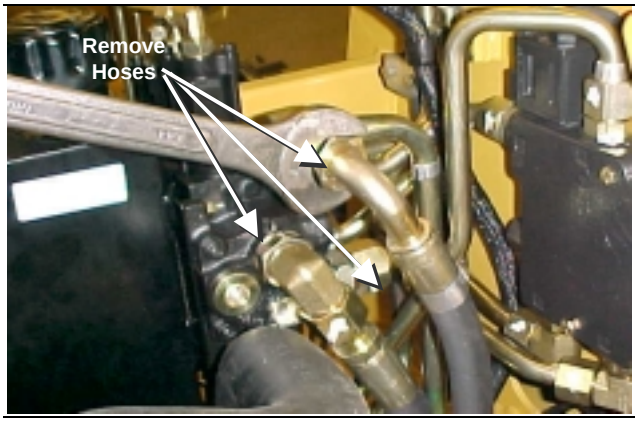


Figure 9-31 9-015

9. Remove the hoses from the end and side of the loader valve. Cap the hoses and fittings.

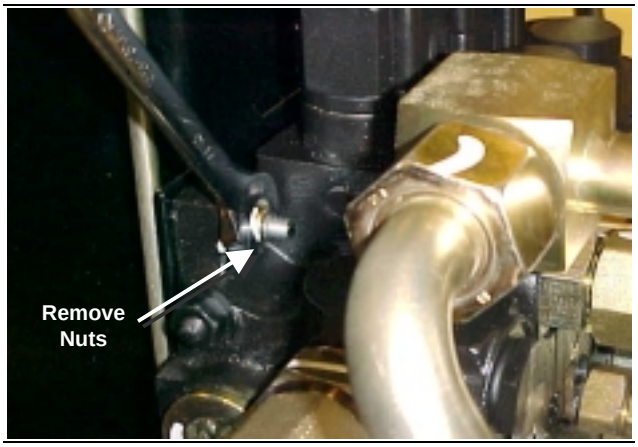


Figure 9-32 9-016

10. Remove the nuts from the four bolts that secure the loader valve to the hydraulic reservoir.

Figure 9-33 9-017

11. Remove the loader valve from the engine compartment.

Loader Valve Installation

Figure 9-34 9-017

1. Position the loader valve against the hydraulic reservoir.

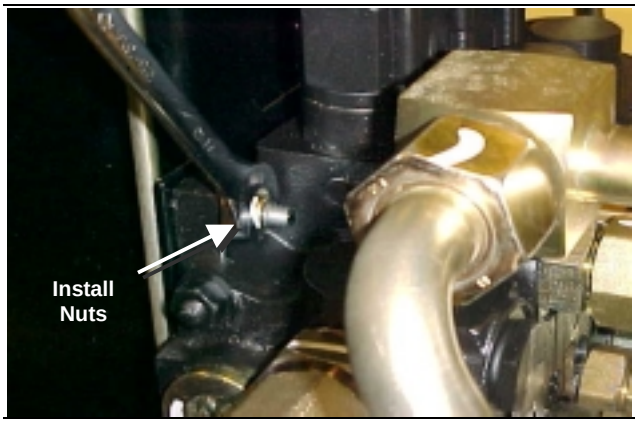


Figure 9-35 9-016

2. Install the nuts on the four bolts that secure the loader valve to the hydraulic reservoir.

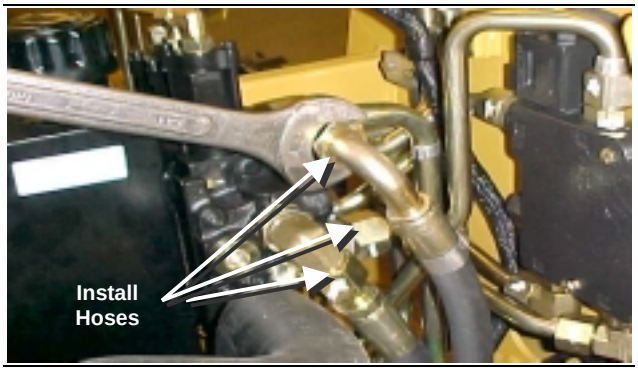


Figure 9-36 9-015

3. Install the hoses on the end and side of the loader valve.

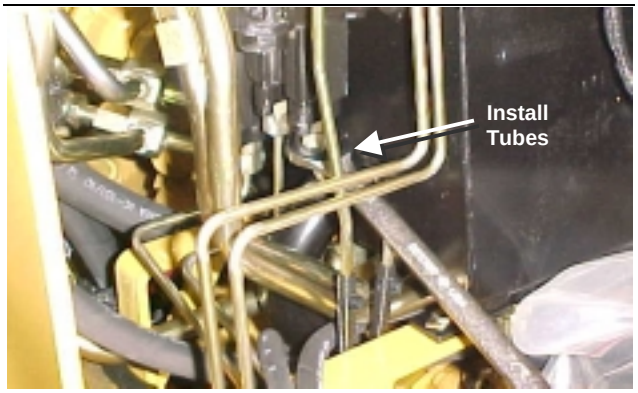


Figure 9-37 9-014

4. Install the tubes on the bottom of the loader valve.

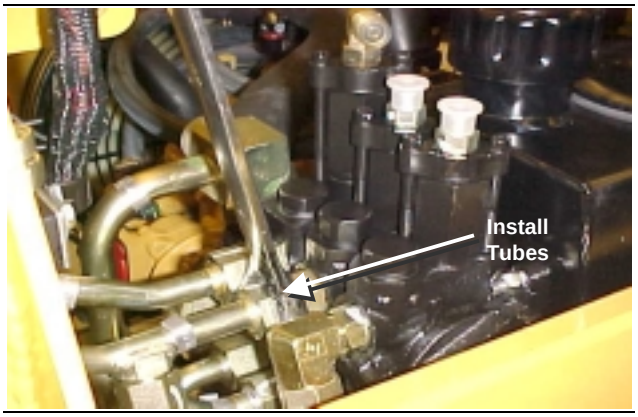


Figure 9-38 9-013

5. Install the tubes on the side of the loader valve.

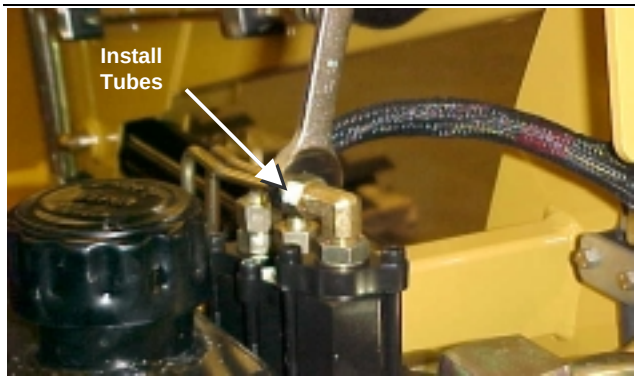


Figure 9-39 9-012

6. Install the tubes on the top of the loader valve.

7. Add manufacturer-approved hydraulic fluid.

Leveling Valve Removal and Installation

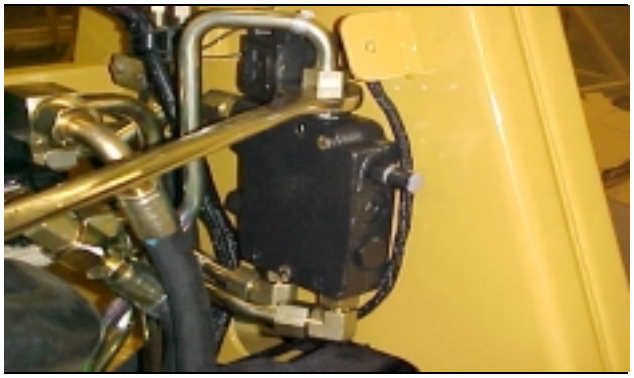


Fig 9-40

1. Remove tube connections and unplug the wiring harness.

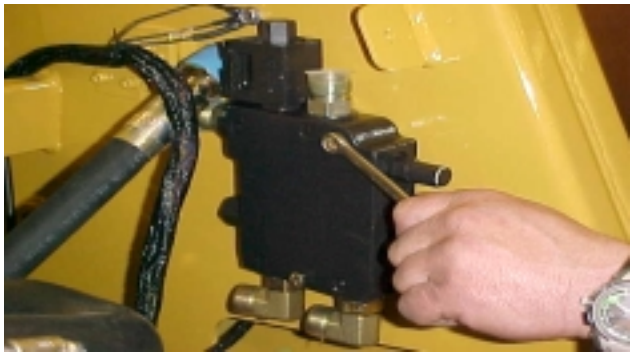


Fig 9-41

2. Remove capscrews holding the valve to the frame. Place plastic caps on all fittings if available.

Fig 9-42

3. Remove the valve.

Leveling valve installation

Fig 9-43

1. Place the leveling valve against the tower and secure in place with the two ¼-20 capscrews in the pretapped holes in the tower.

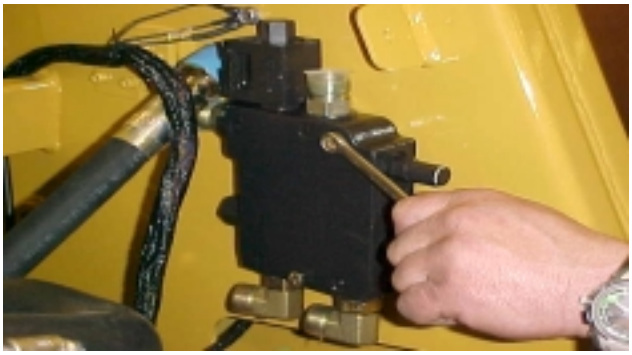


Fig 9-44

2. Tighten capscrews securely.

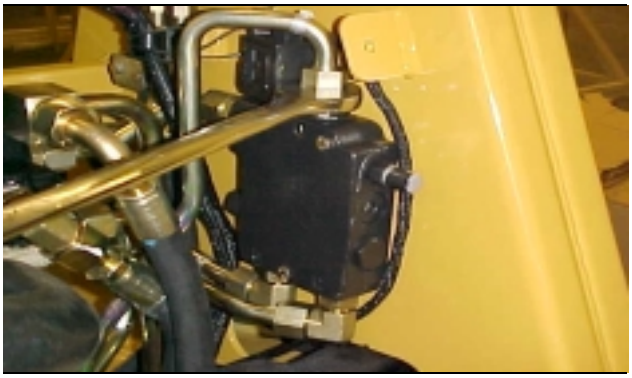


Fig 9-45

3. Reconnect hydraulic tubes and plug in the wiring harness

10. Hydrostatic and Aux. Pump Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the hydrostatic and auxiliary pump.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Hydrostatic and Hydraulic Pump Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following transmission and drive components.

- Auxiliary Gear Pump
- Tandem Pump
- Pump Drive Coupler

Note: Procedures are provided for only those transmission and drive components listed above. However, information for removal and installation of other transmission and drive components can be obtained from the Rubber Track Loader Parts Manual.

Note: Refer to Figure 3-2 for an overview of the auxiliary circuit system and Figure 3-3 for an overview of the drive loop system.

Auxiliary Gear Pump Removal and Installation

The tools required for auxiliary gear pump removal and installation are listed in Table 10-1. Use manufacturer-recommended tools whenever possible.

Table 10-1

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Auxiliary Gear Pump Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your hands.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the lift arms to the ground.
2. Turn the engine start switch to the OFF position.
3. Relieve hydraulic pressure from the auxiliary circuit.
4. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change*.
5. Remove the seat. Refer to *Chapter 6. Seat Removal*.

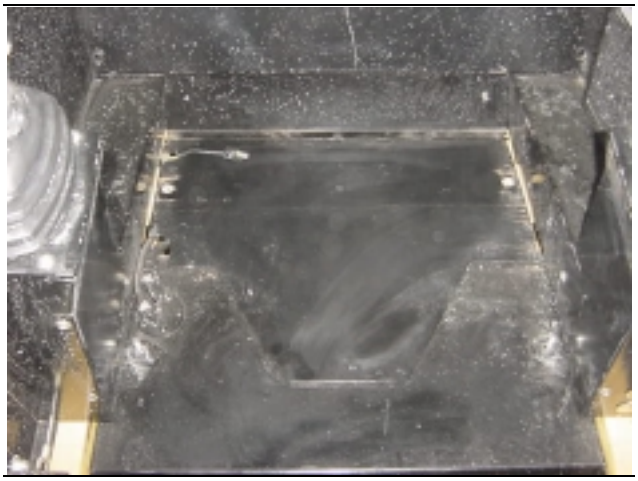


Figure 10-1 10-001

6. View with seat removed.

Figure 10-2 10-002

7. Remove the access cover beneath the seat.

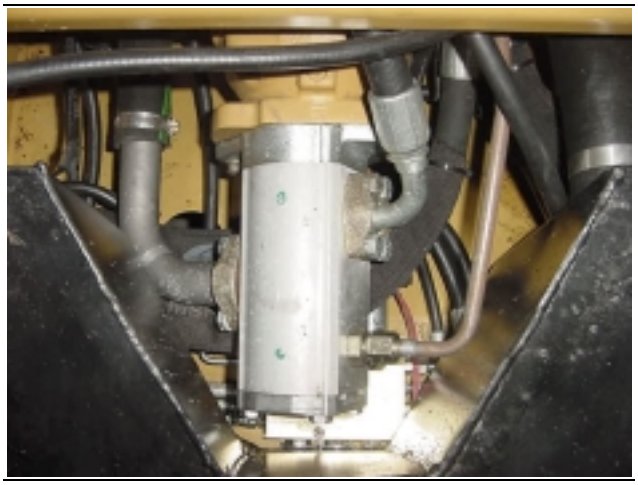


Figure 10-3 10-003

8. Disconnect the 4-bolt split flange fitting.

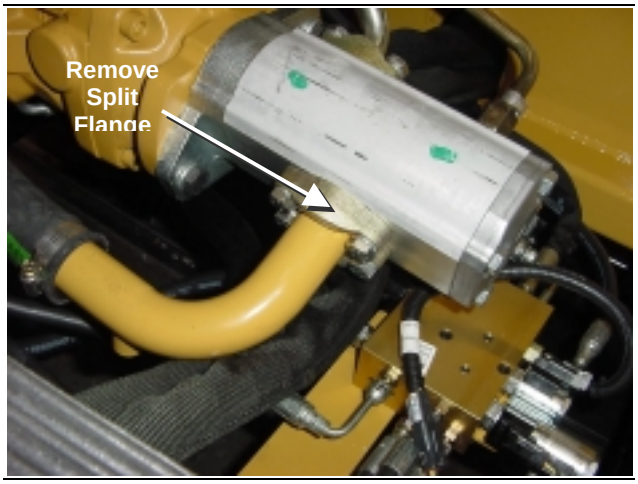


Figure 10-4 10-004

9. Remove the other split flange fitting and the remaining fitting.

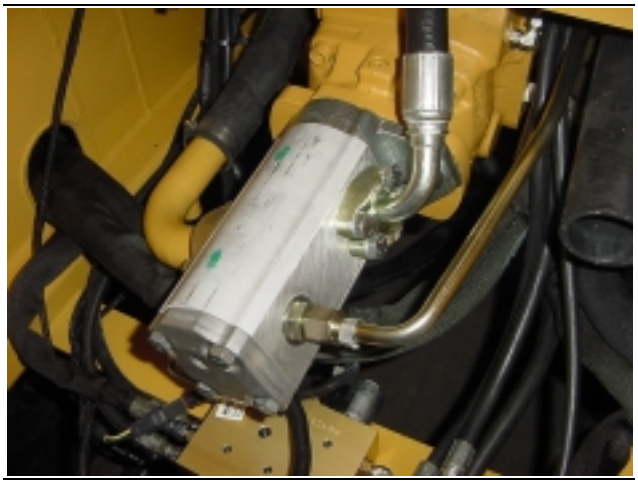


Figure 10-5 10-005

10. Remove the 2 bolts that mount the pump to the hydrostatic transmission, and remove the pump.

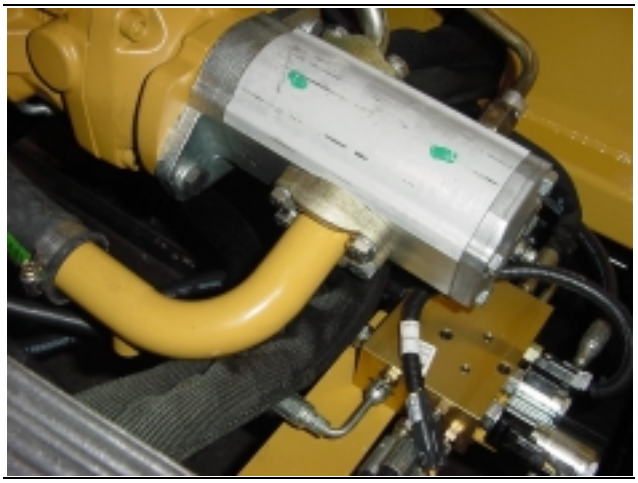


Figure 10-6 10-006

Tandem Pump Removal and Installation

The tools required for tandem pump removal and installation are listed in Table 10-2. Use manufacturer-recommended tools whenever possible.

Table 10-2

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Tandem Pump Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your hands.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the lift arms to the ground.

2. Turn the engine start switch to the OFF position.

3. Relieve hydraulic pressure from the auxiliary circuit.

4. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change*.

5. Remove the seat. Refer to *Chapter 6. Seat Removal*.

6. Remove the auxiliary gear pump. Refer to *Chapter 10. Auxiliary Gear Pump Removal*.

7. Remove the belly pan.

8. Remove all hoses and tubes from the tandem pump. Cap the hoses and tubes.

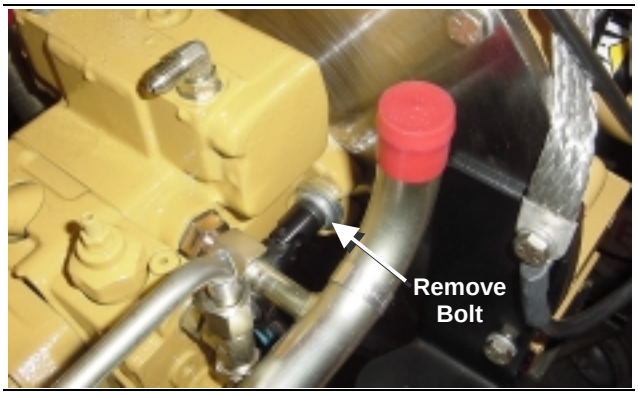


Figure 10-7 10-008

9. Remove the mounting bolt (with spring lock washer and flat washer) from the right-hand side of the tandem pump.

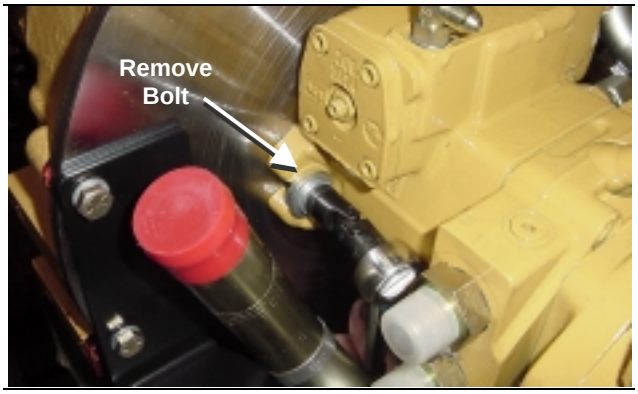


Figure 10-8 10-009

10. Remove the mounting bolt (with spring lock washer and flat washer) from the left-hand side of the tandem pump.

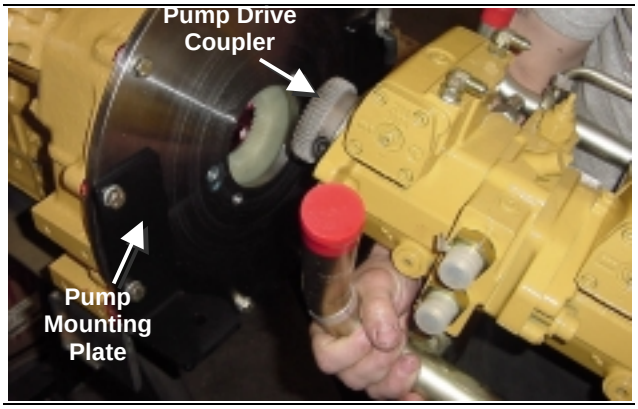


Figure 10-9 10-010

Tandem Pump Installation

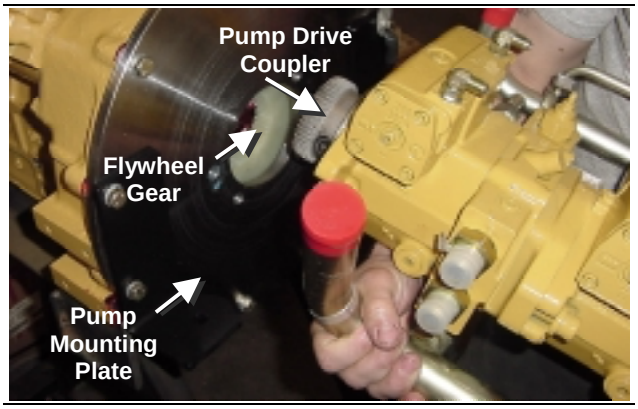


Figure 10-10 10-010

11. Install the mounting bolt (with spring lock washer and flat washer) on the left-hand side of the tandem pump, at 85 ft.-lb. with blue loctite.

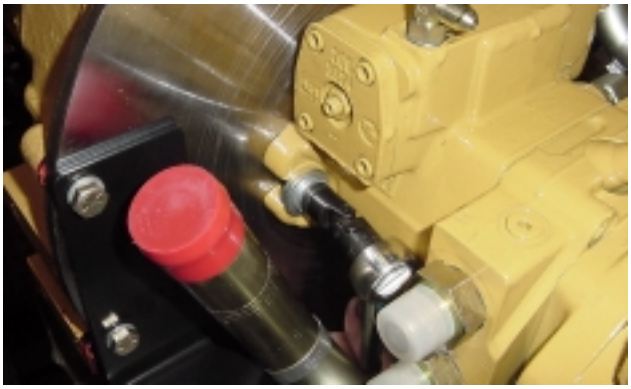


Figure 10-11

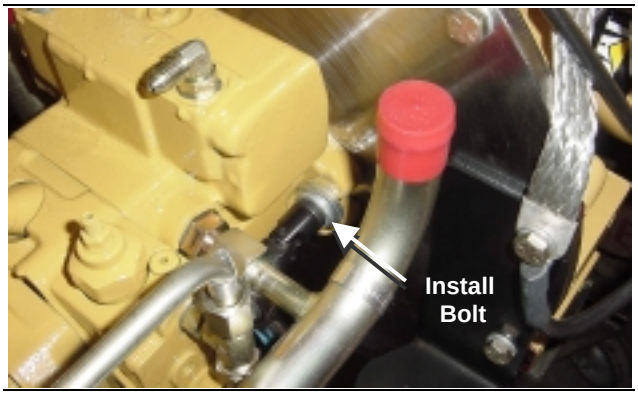


Figure 10-12 10-008

12. Install the mounting bolt (with spring lock washer and flat washer) on the right-hand side of the tandem pump, at 85 ft.-lb. with blue loctite.

13. Install the hoses and tubes on the tandem pump.

14. Install the auxiliary gear pump. Refer to *Chapter 10. Auxiliary Gear Pump Installation*.

15. Install the access cover and seat. Refer to *Chapter 6. Seat Installation*.

16. Add fuel and manufacturer-approved hydraulic fluid.

Pump Drive Coupler Removal and Installation

The tools required for pump drive coupler removal and installation are listed in Table 10-3. Use manufacturer-recommended tools whenever possible.

Table 10-3

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Pump Drive Coupler Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your hands.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the lift arms to the ground.

2. Turn the engine start switch to the OFF position.

3. Relieve hydraulic pressure from the auxiliary circuit.

4. Drain the hydraulic fluid. Refer to *Chapter 16. Hydraulic Fluid and Filter Change*.

5. Remove the seat. Refer to *Chapter 6. Seat Removal*.

6. Remove the auxiliary gear pump. Refer to *Chapter 10. Auxiliary Gear Pump Removal*.

7. Remove the tandem pump. Refer to *Chapter 10. Tandem Pump Removal*.

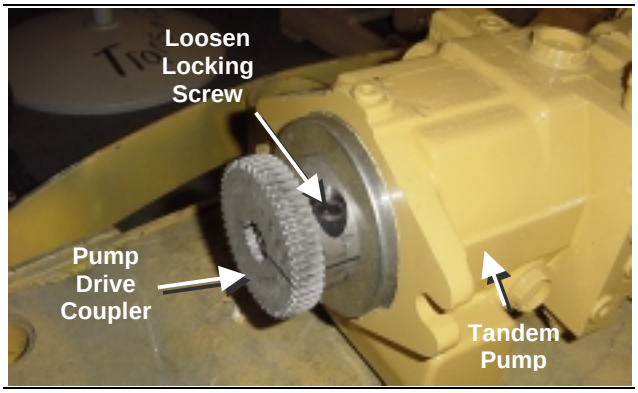


Figure 10-13 10-011

8. Loosen the locking screw that secures the pump drive coupler to the drive shaft extending from the end of the tandem pump.

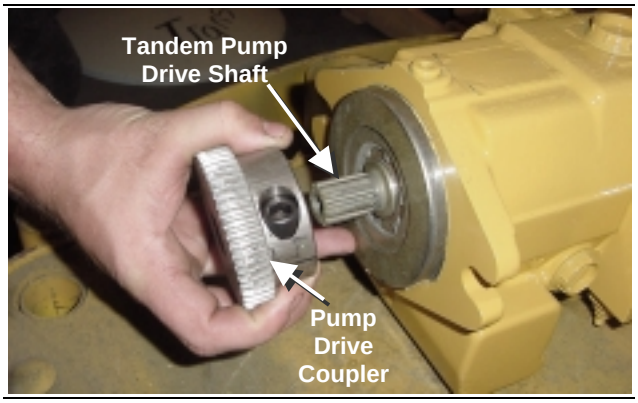


Figure 10-14 10-012

9. Slide the pump drive coupler off the tandem pump drive shaft.

Pump Drive Coupler Installation

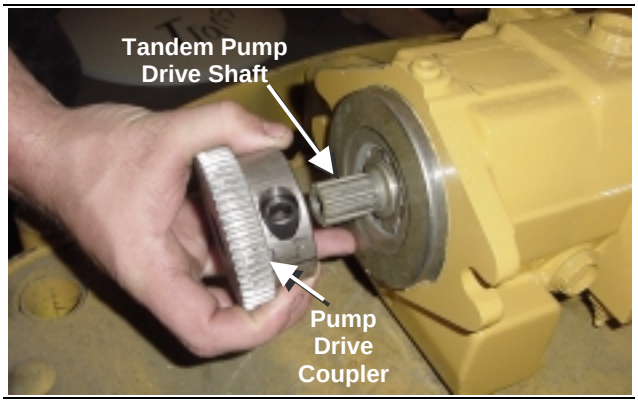


Figure 10-15 10-012

1. Slide the pump drive coupler all the way onto the tandem pump drive shaft.

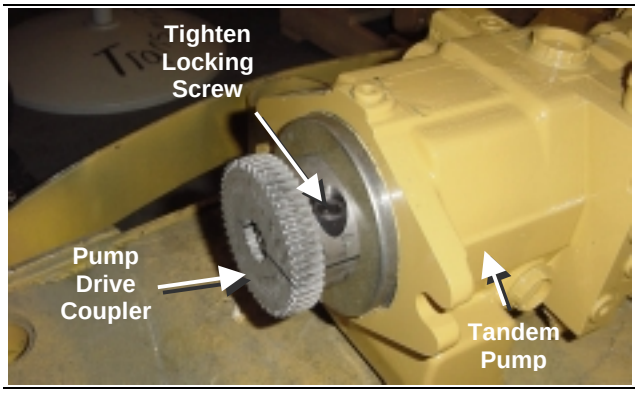


Figure 10-16 10-011

2. Tighten the locking screw that secures the pump drive coupler to the tandem pump drive shaft.

3. Install the tandem pump. Refer to *Chapter 10. Tandem Pump Installation*.

4. Install the auxiliary gear pump. Refer to *Chapter 10. Auxiliary Gear Pump Installation*.

5. Install the seat. Refer to *Chapter 6. Seat Installation*.

6. Add fuel and manufacturer-approved hydraulic fluid.

11. Undercarriage Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the undercarriage assemblies.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Undercarriage Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following undercarriage components.

- Wheels
- Sprockets
- Sprocket rollers
- Sprocket bearing
- Tracks
- Drive motors

Note: Procedures are provided for only those undercarriage components listed above. However, other helpful information can be obtained from the Rubber Track Loader Parts Manual.

Wheel Removal and Installation

The tools required for wheel removal and installation are listed in Table 0-1. Use manufacturer-recommended tools whenever possible.

Table 0-1

Required Tools
Wheel Extractor
Channel Lock Pliers
Socket Wrench
Screw Driver

Wheel Removal

1. Locate the wheel cap snap ring.

Figure 0-1 12-005

2. Use a screw driver to remove the snap ring that secures the wheel cap.

Figure 0-2 12-006

3. Using a large channel lock pliers, remove the wheel cap.

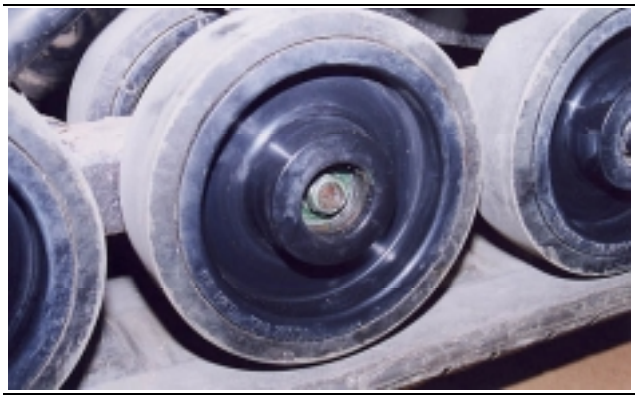


Figure 0-3 12-007

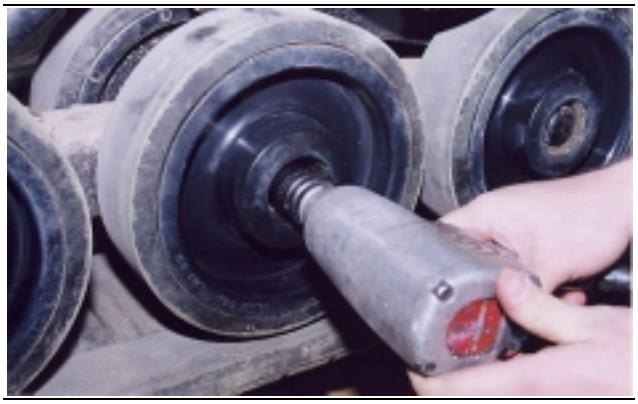


Figure 0-4 12-008

4. Using a socket, remove the nut that fastens the wheel to the shaft. Remove the wheel with the wheel extractor.

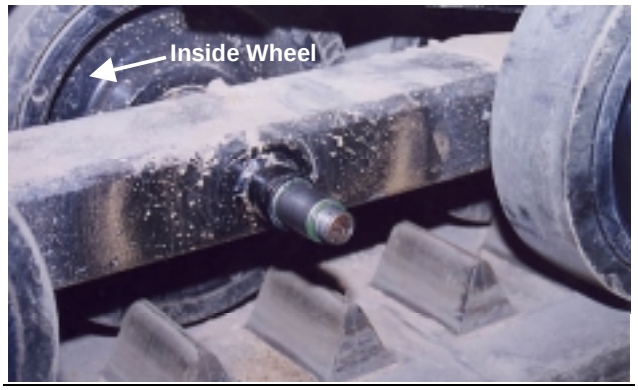


Figure 0-5 12-009

5. To remove an inside wheel, slide under the machine and repeat the wheel removal procedure.

Figure 0-6 12-010

6. With wheels removed, inspect the bearings and axle for wear or damage.

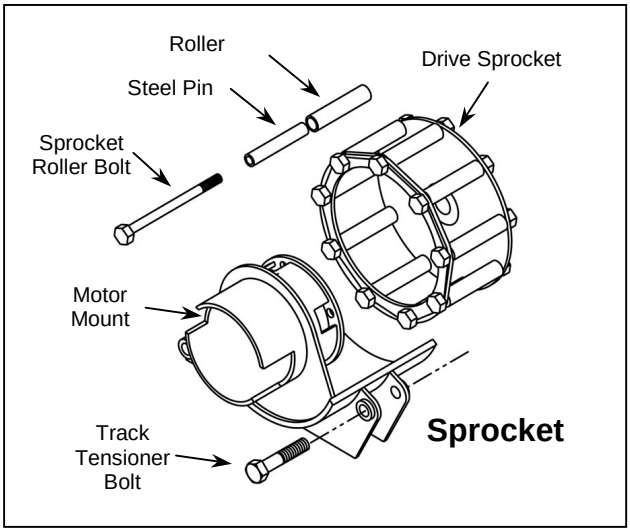
Sprocket Roller Removal and Installation

The tools required for sprocket roller removal and installation are listed in Table 0-2. Use manufacturer-recommended tools whenever possible.

Table 0-2

Required Tools
Socket Wrench
Combination Wrench

Note: The rollers should be inspected every 25 hours for rotation and wear-through. The rollers on the drive sprocket are easily replaceable. The track DOES NOT need to be removed to replace these rollers.



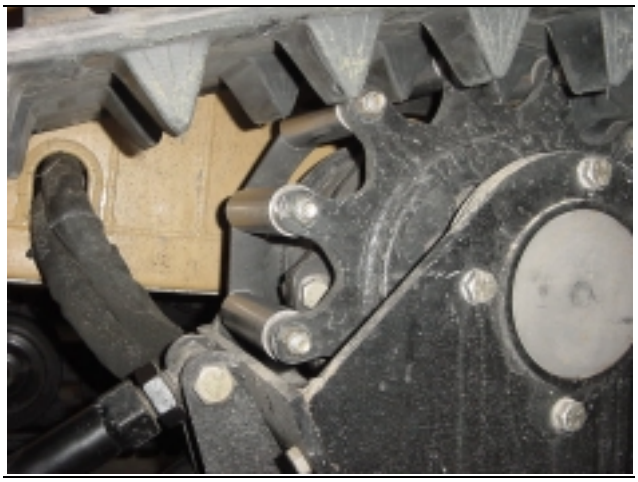


Figure 0-7 12-057

1. Rotate the drive sprocket to allow access to the sprocket roller bolt. Remove the bolt.

2. Remove the roller and steel pin from the drive sprocket.

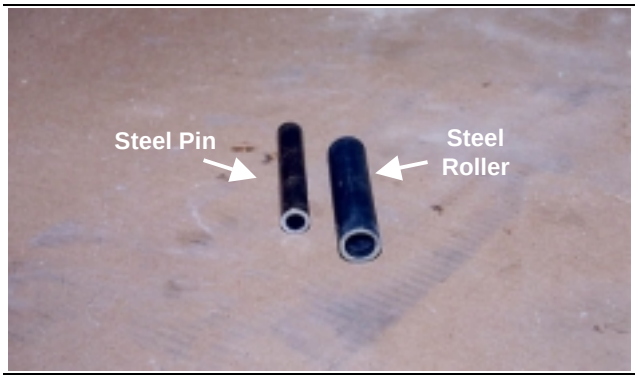


Figure 0-8 12-019

3. Inspect the rollers for wear and replace as necessary. The inner steel pin will normally not need replacing unless the roller has worn completely away and the steel pin is worn.

Track Removal and Installation

The tools required for track removal and installation are listed in Table 0-3. Use manufacturer-recommended tools whenever possible.

Table 0-3

Required Tools	
Socket Wrench	Floor Jack
Combination Wrench	Track Tool
Thread / Seal protector	

Track Removal

! WARNING !

To remove the tracks, the machine must be jacked up and placed on jack stands sturdy enough to support the weight of the machine. The manufacturer-supplied jack stands are recommended.

Figure 0-9 12-016

1. Loosen the track completely by loosen the track jack with an 1 7/8” wrench.
2. Remove the front wheel’s wheel cap and install the thread / seal protector (bullet shaped piece) over the end of the shaft.

Figure 12-9A

Figure 0-10 12-011

3. Using the wheel extractor loosen the front wheel and remove the outside roller bearing. The outside guide lugs will prevent you from removing the front 14” outside wheel without the track coming off at the same time.

Figure 0-11 12-012

4. Remove the 14” wheel. The front 14” outside wheel and the front of the track will come off together.

Figure 0-12 12-013

Track Installation

! WARNING !

To install the tracks, the machine must be jacked up and placed on jack stands sturdy enough to support the weight of the machine. The manufacturer-supplied jack stands are recommended.

Figure 0-13 12-047

1. Place the track around the back wheels and on top of the drive sprocket. Make sure the track drive lugs mesh with the sprocket.

Figure 0-14 12-048

2. Using soap, lubricate the front inside wheel. Pull the track into the position shown in figure 12-15.

3. Install the bullet shaped thread / seal protector over the front wheel shaft.

Figure 12-14A

Figure 0-15 12-049

4. Install the track tool as shown in Figure 0-15.
5. Install the track tool's collar over the 14" wheel hub, make sure the collars hinge bolt is closest to the wheel hub. See figure 12-16.

Figure 0-16 12-053

6. Place the wheel between the outside guide lugs and the inside drive lugs, then pry the wheel along with the track using the track tool. Line up the wheel with the shaft and slide the wheel on. It is very important to use the bullet shaped thread / seal protector during this procedure.

Figure 0-17 12-054

7. Install the wheel nut and torque to 125 ft.-lbs.

Figure 0-18 12-055

8. Tighten the track by turning the track tensioner. When proper track tension has been achieved, tighten the jam nut on the track tensioner.

9. Check for proper track tension. Refer to *Chapter 16. Maintenance – Checking for Proper Track Adjustment*

Sprocket Bearing Removal and Installation

The tools required for sprocket bearing plate removal and installation are listed in Table 0-4. Use manufacturer-recommended tools whenever possible.

Table 0-4

Required Tools
Socket Wrench
Combination Wrench
Snap Ring Pliers
Two pry bars

Sprocket Bearing Plate Removal

1. Remove the track.
2. Remove the soft plug by hitting it with a hammer and chisel on the very edge.

Figure 12-20

3. Remove the snap ring that secures the bearing pack unto the shaft. (Photo shows the bearing pack already removed.)

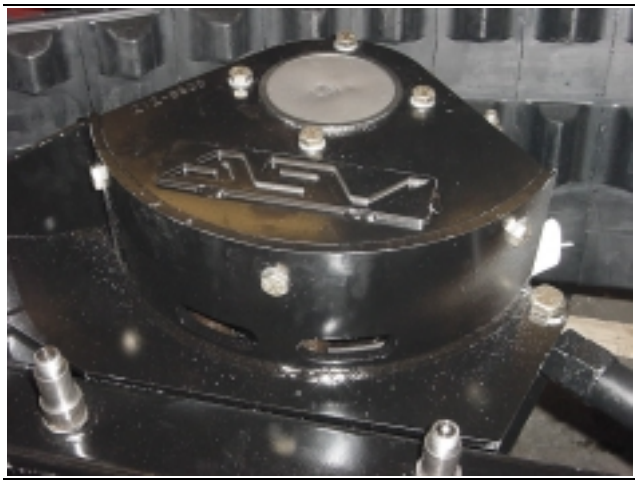


Figure 0-19A 12-023

4. Remove the three bolts on the bottom that fastens the bearing plate to the drive table.

5. Using two pry bars, slowly and carefully pry the bearing plate off of the shaft.

Figure 0-20 12-024

6. Remove the 4 bolts that fasten the bearing pack to the bearing plate.

Sprocket Removal and Installation

The tools required for sprocket removal and installation are listed in Table 0-5. Use manufacturer-recommended tools whenever possible.

Table 0-5

Required Tools	
Socket Wrench	Torque Wrench

Sprocket Removal

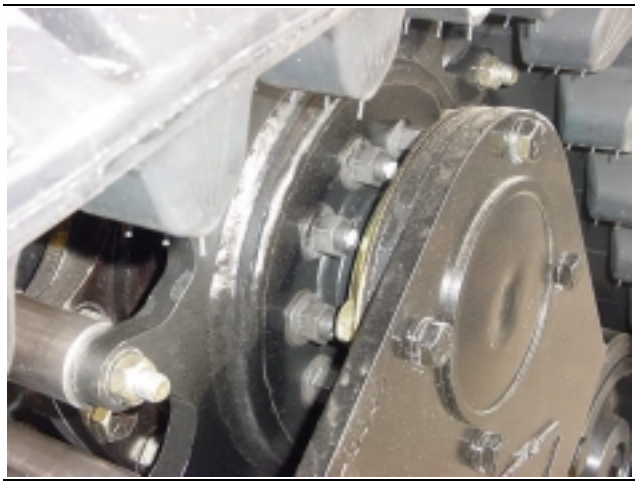


Figure 0-21 12-030

1. Remove the bearing plate as described above. Remove the 10 lug nuts that mount the sprocket to the drive motor.
2. Remove the sprocket.
3. Reverse the procedure for sprocket installation and torque the lug nuts to 160 ft.-lbs.

Drive Motor Removal and Installation

Use manufacturer-recommended tools whenever possible.

Required Tools
Socket Wrench
Crows Foot Attachment

Drive Motor Removal

Figure 0-22 12-035

1. Using a pressure washer or compressed air, clean all hydraulic fittings on the drive motor thoroughly before removing any hoses. Dry the fittings. Remove the hoses and cap immediately.

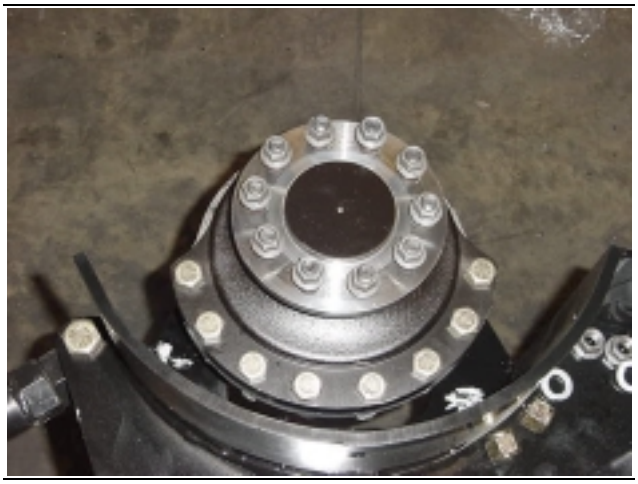


Figure 0-23 12-036

2. Remove the 8 bolts that mount the Drive motor to the drive table.
3. Reverse the procedure to install the drive motor and torque the drive motor mounting bolts to 160 ft.-lbs.

12. Loader Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the loader assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 15. Troubleshooting*.

Loader Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following loader components.

- Lift Cylinders
- Tilt Cylinders
- Low-Flow Relief Valve

Note: Procedures are provided for only those loader components listed above. However, information for removal and installation of other loader components can be obtained from the Rubber Track Loader Parts List manual.

Lift Cylinder/Tilt Cylinder Removal and Installation

The tools required for lift cylinder removal and installation are listed in Table 0-1. Use manufacturer-recommended tools whenever possible.

Table 0-1

Required Tools
Combination Wrench Socket Wrench

Lift Cylinder/Tilt Cylinder Removal

Note: Since the procedures for removing the lift cylinders and tilt cylinders are identical, only the lift cylinder procedure is described below.

! WARNING !

Hot oil can cause personal injury. Lower all attachments and make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your hands.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the loader arms onto a jackstand with the arms resting about 6 inches off the ground.

2. Turn the engine start switch to the OFF position.

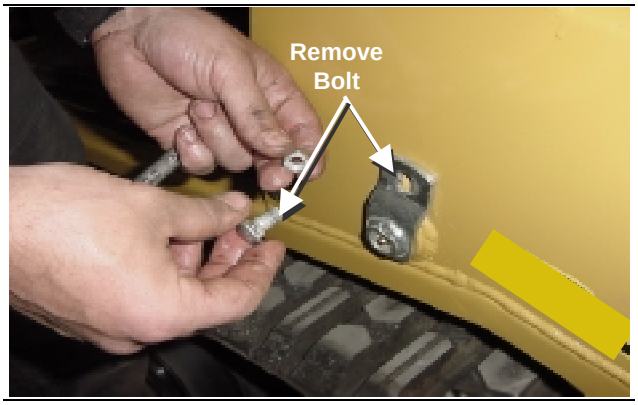


Figure 0-1 13-001

3. Remove the bolt on the pin assembly on the loader tower.

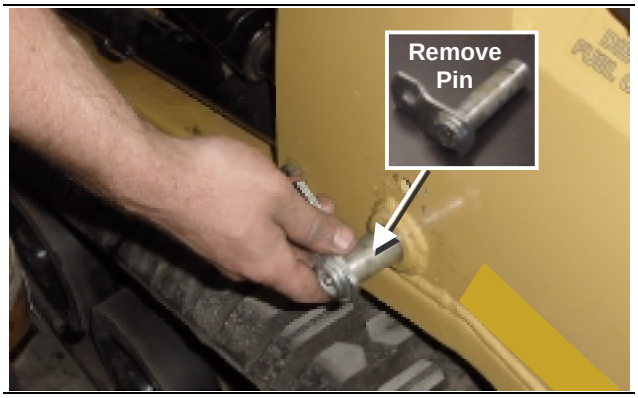


Figure 0-2 13-002

4. Remove the pin assembly.

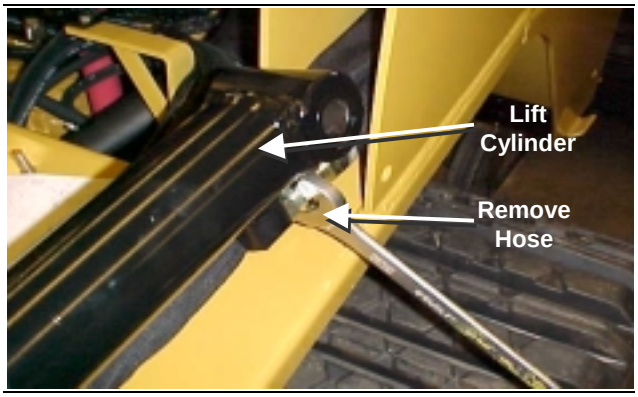


Figure 0-3 13-003

5. Remove and cap the hose on the base end of the cylinder.

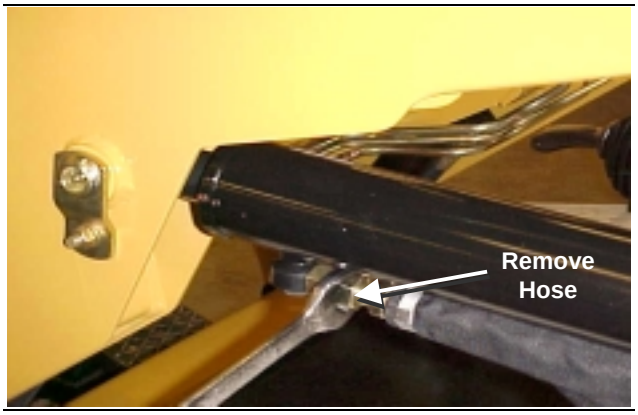


Figure 0-4 13-004

6. Remove and cap the hose on the loader end of the cylinder.

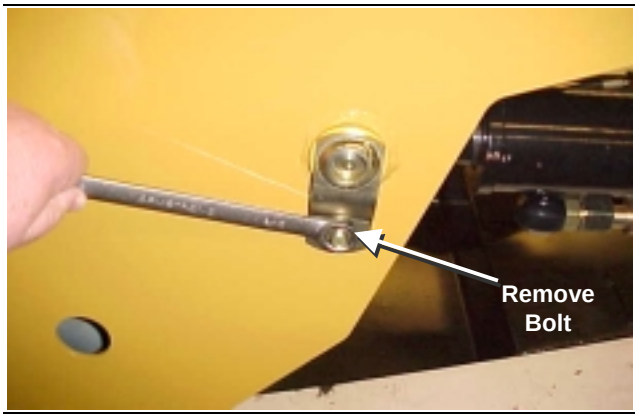


Figure 0-5 13-005

7. Remove the forward pin assembly bolt.

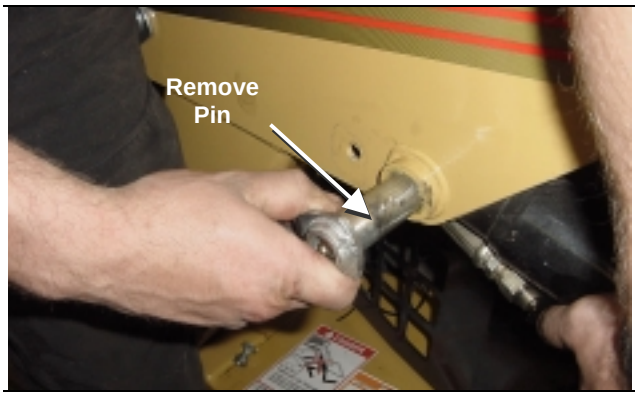


Figure 0-6 13-006

8. Remove the forward pin assembly.

Figure 0-7 13-007

9. Remove the lift cylinder from the machine.

Lift Cylinder/Tilt Cylinder Installation

Note: Reverse the above steps to install the cylinder.

Note: Begin the lift cylinder installation with the loader arms lowered and resting about 6 inches off the ground on a jack stand. This is the position the loader arms were in following lift cylinder removal.

Quick-Coupler Block / Pressure Release Valve Removal and Installation

The tools required for low-flow relief valve removal and installation are listed in Table 0-2. Use manufacturer-recommended tools whenever possible.

Table 0-2

Required Tools
Combination Wrench
Socket Wrench

Pressure Release Valve Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and make sure the oil is cool before removing any components or lines.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the lift arms to the ground.

2. Turn the engine start switch to the OFF position.

Figure 0-8 13-008

3. Press the button on top of the valve to release hydraulic pressure.

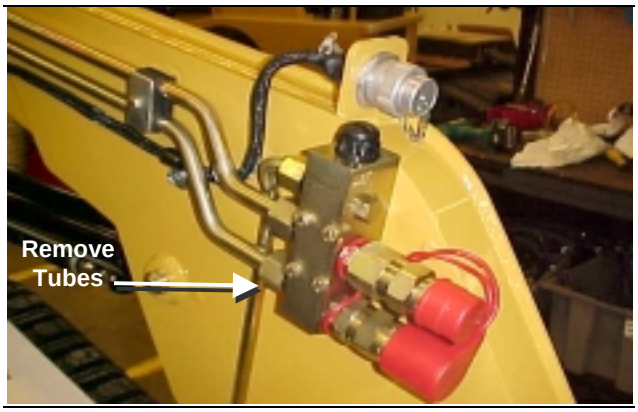


Figure 0-9 13-009

4. Remove and cap all hoses.

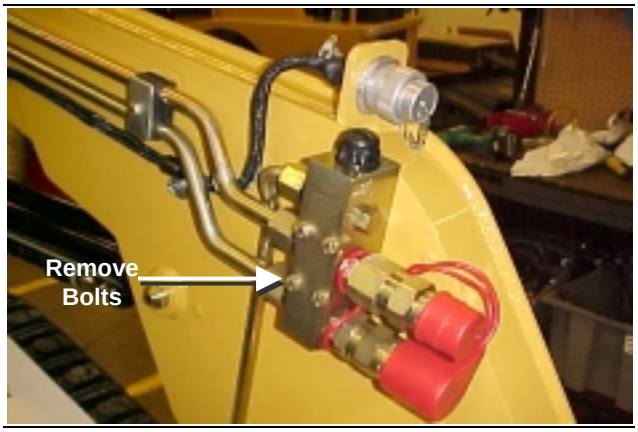


Figure 0-10 13-009

5. Remove the four bolts that secure the low-flow relief valve to the loader frame and remove the valve.

Quick Coupler Block / Pressure Release Valve Installation

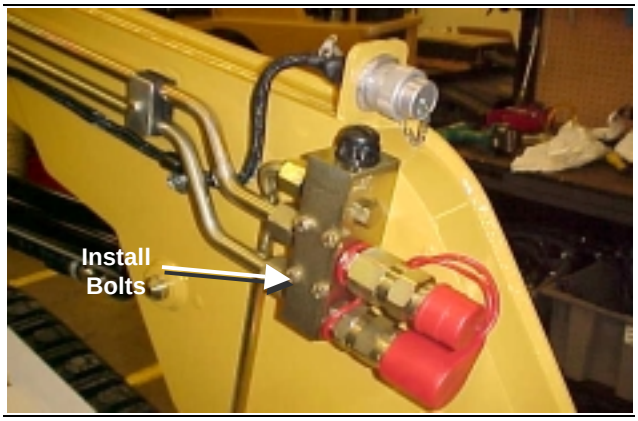


Figure 0-11 13-009

1. Install the four bolts that secure the low-flow relief valve to the loader frame.

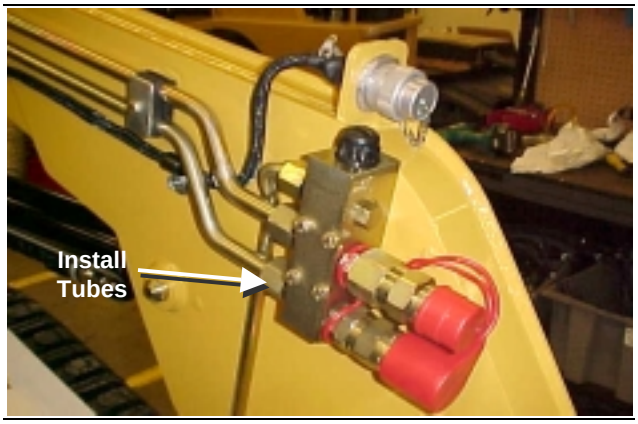


Figure 0-12 13-009

2. Install all hoses.

13. Maintenance

Chapter Overview

This chapter contains maintenance requirements and procedures for the following Rubber Track Loader components.

- Engine oil
- Hydraulic fluid and filter
- Fuel separator and filter
- Track tension
- Air cleaner
- Fuse box
- Grease fittings
- Fuel bleeding

The general maintenance schedule for the Rubber Track Loader is listed in the table below.

Item	Frequency	Lubricant	Capacity
Hydraulic Fluid	500 hrs	**ASV Posi-Lube Hydraulic Oil**, or Rykon MV	8 gal/30 l
Hydraulic Filter	250 hrs		
Engine Oil	250 hrs	**Posi-Lube HD Diesel Engine Oil**, or other	2.6 gal/9.8 l
Engine Filter	250 hrs		
Fuel Filter	500 hrs		
Primary Air Filter	Check daily, clean and reuse as needed up to 5 times; change at least once per year		
Secondary Air Filter	Every 3 cleanings of primary filter		
Grease Fittings	10 hrs	**Posi-Lube Lithium Grease**	
Track Tension	As needed		
Coolant	Test for coolant additive at 250 hrs. Change at 1000 hrs or two years		

NOTICE

When replacing engine coolant, use **Posi-Lube Long Life 50/50 Antifreeze/Coolant**, Caterpillar Extended Life Coolant or equivalent antifreeze with the proper SCA (Supplemental Cooling Additive)

Engine Oil

The normal oil change interval is every 250 service hours or six months, whichever comes first. Engines that are operated under severe conditions may need the oil changed every 100 service hours or every 3 months, whichever comes first. Severe operating conditions include: high temperatures, continuous high loads and dusty conditions.

Oil Change Procedures

1. Run the engine for a few minutes to warm the engine oil.

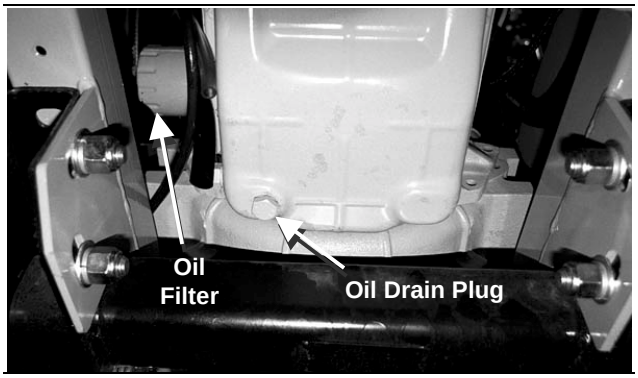


Figure 16-1 16-001

2. Remove the drain plug from the bottom of the engine.
3. Drain oil into suitable container.
4. Remove engine oil filter, making sure the gasket is also removed.
5. Put some fresh oil on the new filter gasket and install new filter.
6. Tighten filter to specifications on filter label.
7. Refill engine to capacity with oil, as specified.

Engine Oil Specifications

Due to the significant variations in the quality and performance of commercially available oils, ASV **Posi-Lube Heavy Duty Diesel Engine Oil** – 10W30 is recommended. If Posi-Lube is not available, use one of the the following:

- Caterpillar Diesel Engine Oil – 10W30 (-4°F to 104°F)
- Caterpillar Diesel Engine Oil – 15W40 (5°F to 122°F)

Use only use commercial oils that meet the following classifications:

- EMA LRG-1 multigrade oil
- API CG-4 multigrade oil
- API CH-4 multigrade oil
- API CF-4 multigrade oil

Hydraulic Fluid and Filter

The hydraulic fluid should be changed every 500 service hours, and the hydraulic filter should be changed every 250 hours. Hydrostatic components require extremely clean oil for long service life.

Hydraulic Fluid and Filter Change Procedures

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand.

NOTICE

Extreme care must be taken when changing the hydraulic fluid. Before starting the procedure, make sure the machine is in a clean working environment. Precautions should be taken to prevent any debris from entering the hydrostatic system.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

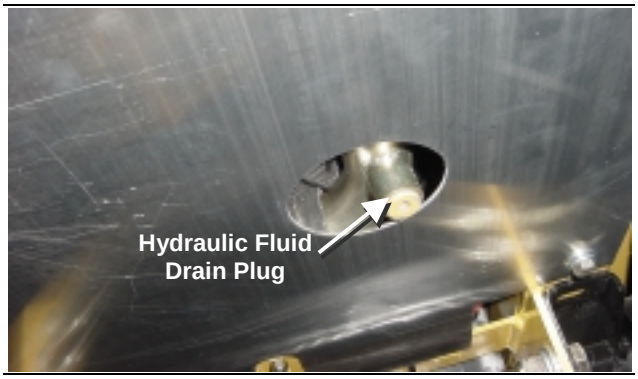


Figure 16-2 16-002

1. Locate and remove the hydraulic fluid drain plug and drain the fluid into a suitable container.

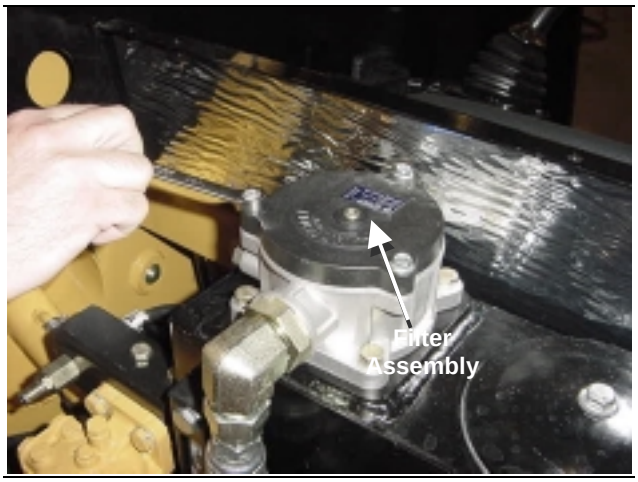


Figure 16-3 16-015

2. Clean the area around the filter assembly, which is located on the top of the hydraulic reservoir.

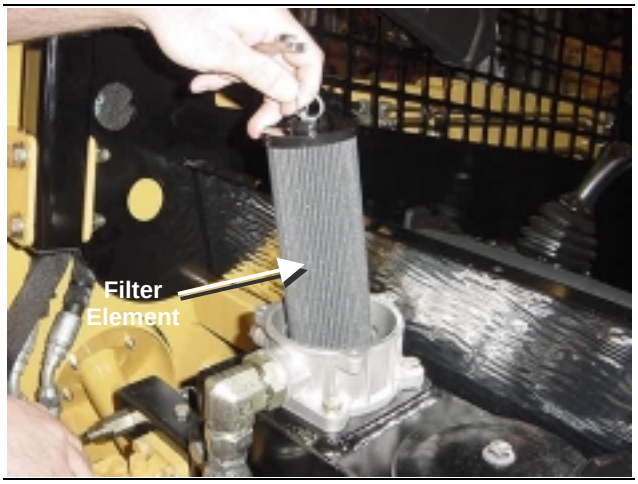


Figure 16-4 16-003

3. Turn the hydraulic filter counter clockwise and remove the filter
4. Change the filter element and replace the filter in the tank.
5. Fill with manufacturer-approved hydraulic fluid.

Fuel-Water Separator

1. Turn the fuel shut off valve up to close the fuel supply.
2. Remove the retaining ring from the fuel-water separator.
3. Remove the bowl, float, spring, and screen.
4. Dump any water from the bowl, and make sure the screen is clean.

5. Reinstall components and reopen the fuel shut off valve by turning to the down position.

Fuel Filter

The fuel filter should be changed every 500 service hours, or as needed. A plugged fuel filter can cause loss of engine power, rough running, or no start.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Fuel Filter Change Procedures

Figure 16-5 16-004

1. Clean the outside of the filter thoroughly.
2. Remove the spin-on filter and dispose of properly.
3. Pour diesel fuel into the new filter until it is full.
4. Spin the new filter into place and tighten.

Fuel Specifications

In North America, diesel fuel distilled from crude oil and identified as NO. 1-D or No. 2-D in “ASTM D975” generally meets the proper specifications.

Air Cleaner

The air cleaner is one of the most important maintenance items on the machine. A poorly maintained air cleaner can seriously shorten the life of the engine.

Air Filter Change Procedures

NOTICE

When working in dusty conditions, the air cleaner elements should be checked and changed more frequently than when working under normal conditions.

NOTICE

Do not clean the primary air cleaner element by bumping and tapping. This could damage the seals. Do not use elements with damaged pleat gaskets or seals.

1. Open the hood, release the latches on either side of the air cleaner, and then remove the cover.

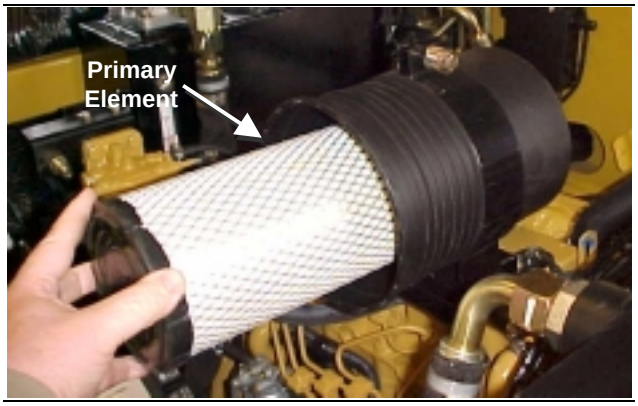


Figure 16-6 16-010

2. Remove the primary element. The primary element can be cleaned and reused up to five times, but it should be changed at least once a year.

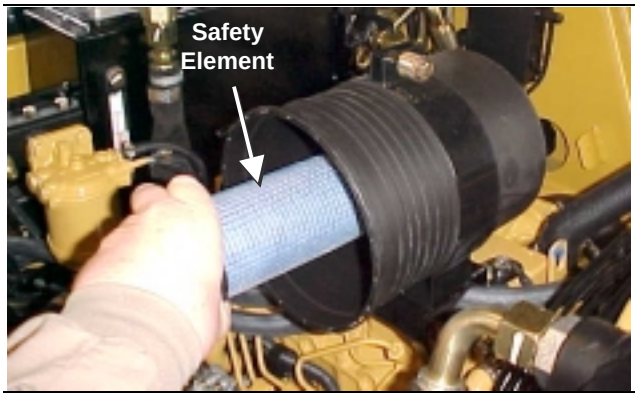


Figure 16-7 16-011

3. Remove the safety element. The safety element is not serviceable or washable. It should be replaced with every three cleanings of the primary element.

Track Tension

Proper track tension is very important for optimum performance and long track life. Tracks that are run too loose can cause misfeeding and ratcheting possibly causing damage to the track. During the first 50 hours of operation, the tracks will “break in” and will most likely require adjustment.

Track Tension Adjustment Procedures

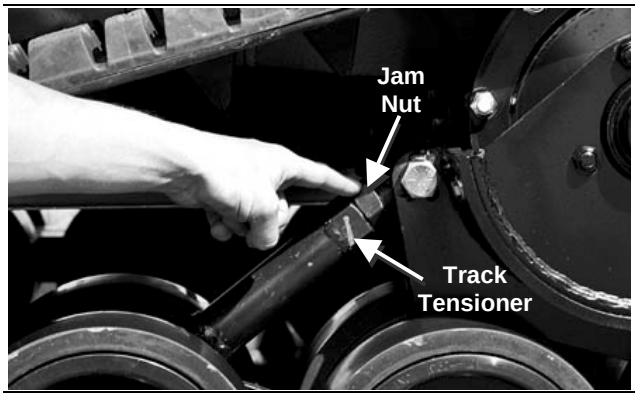


Figure 16-8 16-005

1. Locate the jam nut on the track tensioner and clean the threads thoroughly before proceeding.

2. Loosen the jam nut. You can use the wrench supplied with the machine, but a standard wrench is preferred for shop use.

Figure 16-9 16-007

3. After loosening the jam nut, turn the track tensioner until the track tension is within specifications.

4. Once proper tension is achieved, retighten the jam nut

Checking for Proper Track Adjustment

1. Drive the machine forward five feet.

Figure 16-10 16-008

2. Lay a straightedge along the top of the track between the sprocket and the front idler wheel.
3. Using a rope or wire, put 50 pounds of down force on the track at the midpoint of the straightedge.

Figure 16-11 16-009

4. Using a ruler, measure the distance between the straightedge and track. The track should not deflect more than 0.75” between the top of the track and the straightedge.
5. If the track deflects more than 0.75”, tighten the track between 0.50” and 0.75”.

Fuse Box

Figure 16-12 16-012

The fuse box is located on the left side of the engine compartment. The machine should never be operated with the fuse box cover removed.

Grease Fittings

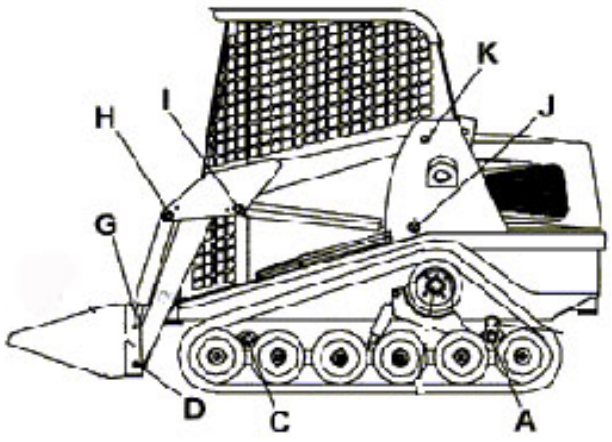


Figure 16-13 16-013

The locations of the grease fittings for the left side of the machine are shown above. An identical set of fittings is located on the right side of the machine. These fitting should be lubricated at least after every 10 hours of operation using **Posi-Lube Multi Purpose EP Lithium Grease**.

Bleeding the Fuel System

The tools required for bleeding the fuel system are listed below. Use manufacturer-recommended tools whenever possible.

Table 16-1

Required Tools
Combination Wrench

If the machine has been run out of fuel, it may be necessary to bleed the fuel system.

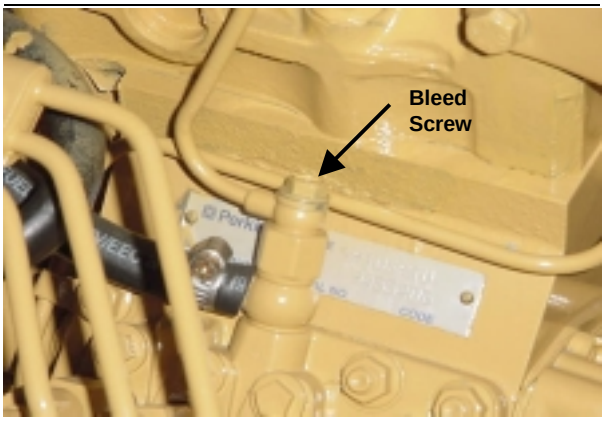


Figure 11-25 11-006

1. Locate the bleed screw directly above the fuel injection pump.

2. Loosen the bleed screw two full turns.

Figure 11-27 11-004

3. Pump the bulb primer with your hand until fuel flows from the bleed screw without any air bubbles.

4. Tighten the bleed screw.

14. Hydraulic Pressure Check & Adjustment

Chapter Overview

This chapter provides a overview of checking and setting pressures. It is important to contact the manufacturer for assistance before beginning these procedures.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Hydraulic Pressure Adjustment Procedures

Adjustment and test procedures are provided for the following transmission and drive components.

- Charge Pressure Check & Adjustment
- Auxiliary Valve Pressure Check & Adjustment

Charge Pressure Check

The service tools required for the charge pressure check are listed in Table 0-1. Use manufacturer-recommended tools whenever possible.

Table 0-1

Required Tools
Pressure Gauge
Combination Wrench

Figure 0-1 10-101

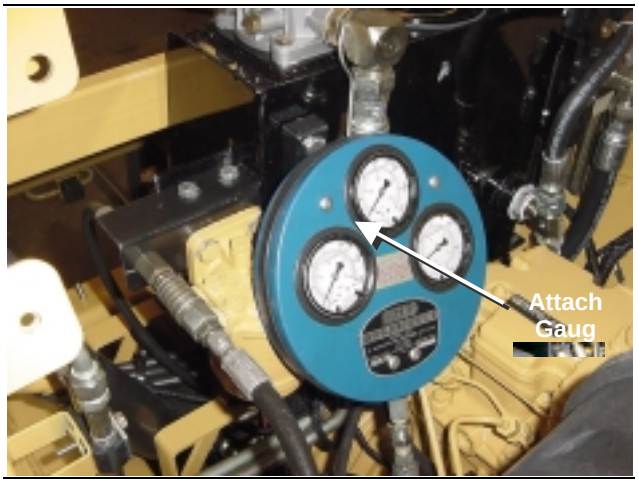


Figure 0-2 10-102

1. Attach the gauge to the charge pressure test port, located next to the fuel filter.

2. Start the engine.

3. Check the pressure with the engine at wide open throttle. Make sure the engine is properly warmed up before running wide open. Charge pressure should be between 400 and 450 psi.

4. Turn the engine start switch to the OFF position.

5. Remove the gauge from the test port.

6. Install the floor pan

Auxiliary Pressure Check & Adjustment

The service tools required for the auxiliary pressure check and adjustment are listed in Table 0-1. Use manufacturer-recommended tools whenever possible.

Table 0-2

Required Tools
Pressure Gauge
Allen Wrench

Figure 10 10-110

1. Insert the hydraulic gauge into one of the attachment quick couplers.

Figure 11 10-111

2. Engage the continuous flow switch next to the key switch. Make sure it is in the direction that sends flow to the gage.

3. There must be an operator in the seat with the lap bar down for the flow to work.

4. Pressure should be approximately 3000 psi.

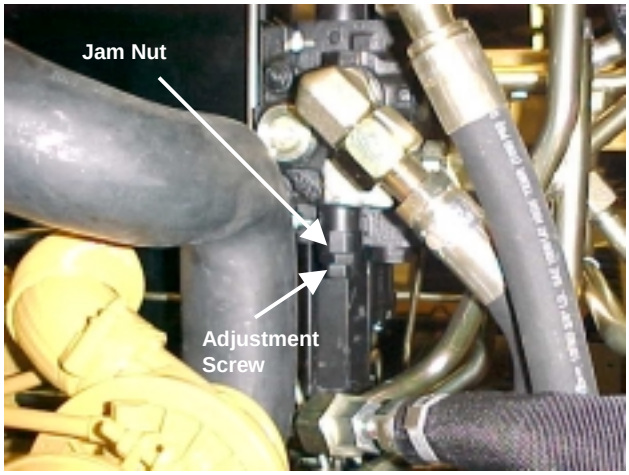


Figure 13 10-113

5. To adjust the auxiliary pressure, loosen the jam nut and turn the adjustment screw in with an allen wrench to increase pressure and turn screw out to decrease pressure. Tighten jam nut when after adjustment has been made. **DO NOT exceed 3,000 psi**.

15. Troubleshooting

Chapter Overview

This chapter contains basic troubleshooting procedures for the Rubber Track Loader.

Additional troubleshooting aids are provided in *Chapter 3. System Diagrams* and in those chapters containing disassembly and assembly procedures for the appropriate component or assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any troubleshooting procedures, refer to *Chapter 2. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any troubleshooting procedures, refer to *Chapter 2. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

A simple visual inspection and operational check can identify many problems without the need for extensive troubleshooting. If these checks indicate a problem that requires further analysis, proceed to *Troubleshooting* in this section.

Visual Inspection

Prior to troubleshooting, do a walk-around and perform a visual inspection of the machine. Look for missing, loose or worn parts. Perform the following visual checks.

- Track tension
- Fluid levels
- Fan belt tension and condition
- Hoses (no visible sign of wear)
- Fittings (no leaks)
- Battery cables
- Fuse box (fuses in place and operational)
- Controls (for neutral)

Troubleshooting

This section identifies selected problems and suggests probable causes.

Problem 1

Machine will not crank over.

Probable cause

1. Continuous hyd. flow switch activated.
2. Weak or dead battery.
3. Faulty continuous hyd. flow switch
4. Battery cables loose or corroded.
5. Ignition fuse blown.
6. Main starter fuse blown.
7. Starter relay malfunctioning.
8. Bad ignition switch.
9. Bad starter.
10. Poor wire connections at key, relay, or starter.

Problem 2

Machine cranks but will not start.

Probable cause

1. Injection pump fuse blown.
2. Main power fuse B blown.
3. Main power relay B not activating.
4. Poor wire connection at injection pump or fuse.
5. Glow plugs not heating. (Will see black smoke.)
   a) Main glow plug fuse blown.
   b) Glow plug relay not activating.
   c) Poor wire connections at ignition switch, relay, or glow plug strip.
   d) Failed glow plugs.
   e) Bad ignition switch.

Problem 3

Machine starts but hydraulics will not operate.

Probable cause

1. Lap bar must be in down position, operator must be seated in seat, and front door (if installed) must be closed.
2. Safety fuse blown.
3. Faulty operator presence switch.
   a) Test continuity through seat, lap bar, and door switch. Adjust or replace as necessary. Lap bar and door switch are magnetic switches and should be adjusted to approximately 1/16 inch away from steel pickup bracket.
4. Poor ground (check ground wires on bottom left rear side of hydraulic reservoir).
5. Safety relay is not activating.
6. Faulty safety solenoid or safety solenoid spool.
7. Poor wire connections on fuse, relay, or safety solenoid.
8. Low charge pressure.

Problem 4

Loader operates but tracks will not move.

Probable cause

1. Leak in feed line to pilot control.
2. Pilot control malfunctioning.
3. Low pilot pressure.

Problem 5

Tracks operate but loader will not operate.

Probable cause

1. Continuous hyd. flow switch activated, sending oil over relief.
2. Check to see if auxiliary flow works. (If auxiliary flow works, skip to number 5).
3. Main auxiliary relief malfunction.
4. Auxiliary pump bad.
5. Leak in feed line to loader control pilot.
6. Loader control pilot malfunctioning.
7. Loader valve malfunctioning.

Problem 6

Auxiliary flow does not work. Loader works.

Probable cause

1. Auxiliary hydraulic fuse blown.
2. Faulty ground wire.
   a) Clean ground connections on left rear side of hydraulic tank.
3. Auxiliary hydraulic switch failure.
4. Poor wire connections at fuse, auxiliary hyd. switch, or pin connector P17.
5. Auxiliary hydraulic pilot generation spool stuck.
6. Bad or not fully connected Quick-Coupler

Problem 9

Auxiliary hydraulics will only flow one way. Try both continuous flow and intermittent thumb switch.

Probable cause

1. Auxiliary hydraulic relay 1 or 2 failure.
2. Auxiliary hydraulic pilot generation coil faulty.
3. Auxiliary hydraulic pilot generation spool faulty.
4. Poor wire connections at relay, pilot generation solenoid, pin connector P16 or P21.
5. Loader valve malfunction.

Problem 10

No power to numerous auxiliary functions or accessories in ON or RUN position.

Probable cause

1. Main power relay A or B fuse blown.
2. Main relay A or B faulty.
3. Ignition switch malfunction.
4. Poor wire connections at ignition switch, fuse, or relay.

Problem 11

Battery will not charge and/or battery goes dead.

Probable cause

1. Alternator fuse blown.
2. Alternator diode bad.
3. Poor wire connections at battery, alternator, diode, or fuse.
4. Excessive draw in off position.
   a) Fuel gauge and hour meter should draw only 0.01 amps in off position.
5. Bad battery.
6. Bad alternator.

Problem 12

Loader control will not lock in float position.

Probable cause

1. Float magnet fuse blown.
2. Poor wire connections at fuse, float detent magnet, or pin connector P18.
3. Faulty float detent magnet.

Problem 13

Loader will not float; labors engine and has down pressure when detented into float.

Probable cause

1. Engine RPM too low.
2. Low charge pressure.
3. Pilot control malfunction.
4. Loader valve malfunction.

Problem 14

Hot oil light illuminates; hydraulic system operating hot.

Probable cause

1. Auxiliary hydraulic switch activated sending oil over relief.
2. Low oil level.
3. Debris plugging oil cooler limiting airflow.
4. Broken fan blades.
5. Loose fan belt.
6. Improper attachment.
   a) Attachment must be rated at a minimum of 16.3 gallons per minute and 3000 PSI.
   b) Attachment hose size must be a minimum of 1/2 inch.
7. Faulty hot oil sending unit.
   a) Hot oil light should illuminate at 225°F.
8. Faulty quick coupler.
9. Cooler bypass relief.
   a) Cooler bypass relief should open at 80 PSI.

Problem 15

Track makes popping noise.

Probable cause

1. Track too loose. (Refer to track adjustment section.)
2. Worn or stuck drive teeth. Outer roller should pivot as lug comes into sprocket.
3. Loose or worn sprocket.
4. Worn track lugs.

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